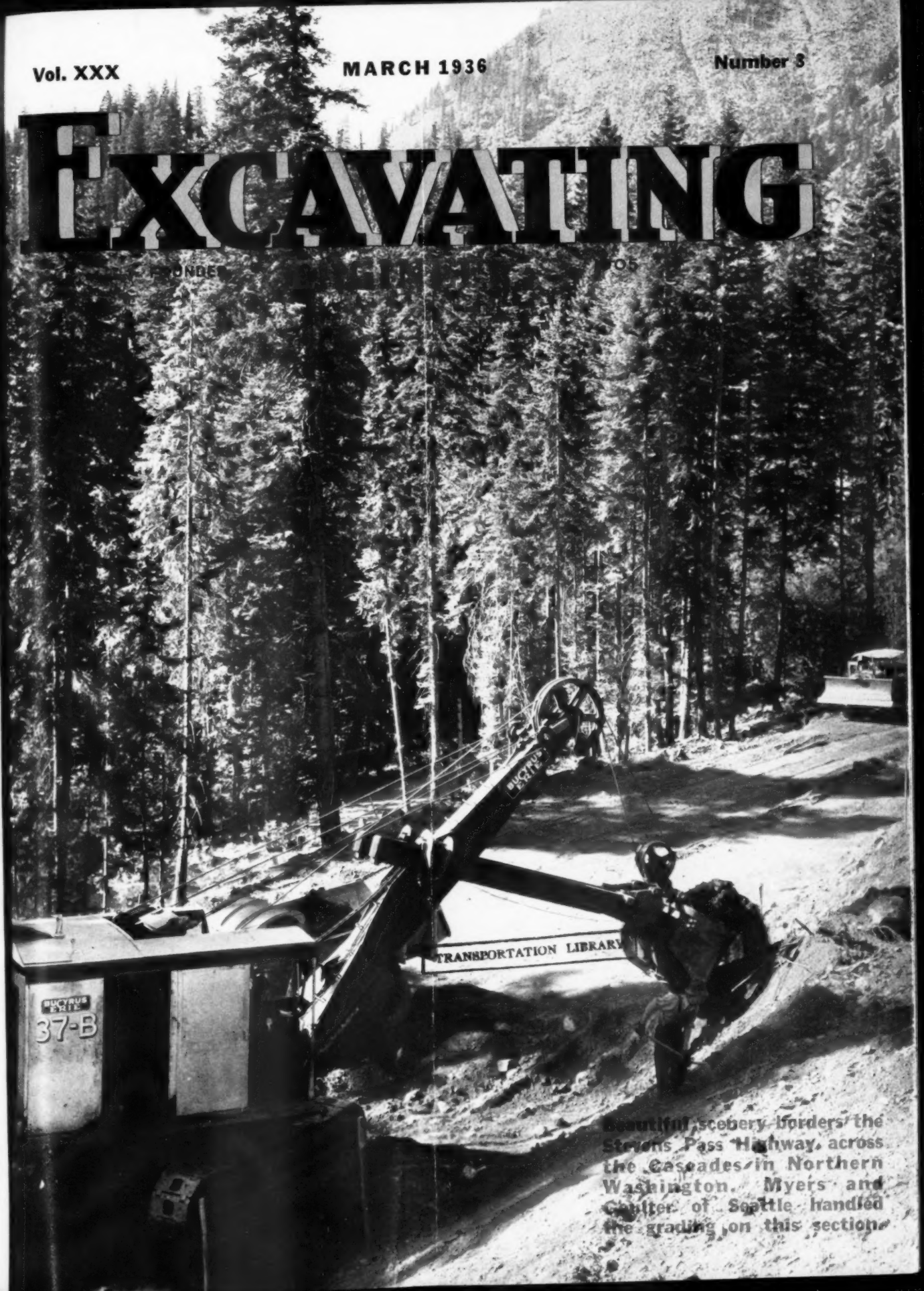
Vol. XXX MARCH 1936 Number 3

EXCAVATING



Beautiful scenery borders the Stevens Pass Highway across the Cascades in Northern Washington. Myers and Chalter of Seattle handled the grading on this section.

On the Leesville Dam in Ohio, this "Caterpillar" Diesel Tractor works with a bulldozer, helping to move 700,000 cubic yards of material.

FIRST FOR THE SCHEDULES! FIRST ON THE JOB!

When it comes to working out bids and schedules, you'll find that tractor costs are being based more and more on what the "Caterpillar" Diesel Tractor can do—its low-cost operation and dependability make possible winning bids with an honest profit margin. When it comes to meeting the schedule and keeping the job moving smoothly, it's the "Caterpillar" Diesel again—hanging up records for low cost per hour, more working hours per day, more work per hour. It is FIRST on every count—get the details from your dealer. Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

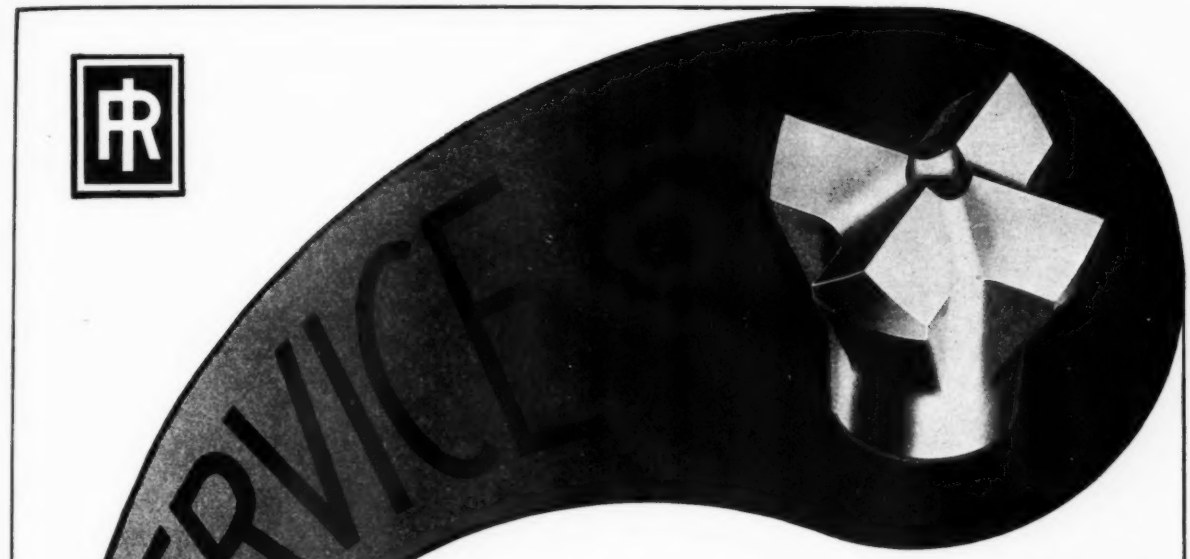
HERE ARE FACTS ON THE SHOW-DOWN

A Texas owner reports: "My 'Caterpillar' Diesel Tractor does the same work as my old gasoline tractor, but my fuel cost is now $1.20 per day, where it used to be about $7.70."

On the Mississippi Levee, a contractor reports that his "Caterpillar" Diesel has been hauling big loads from a drag-line at a fuel cost of only 15c per hour.

CATERPILLAR DIESEL

REG. U. S. PAT. OFF.



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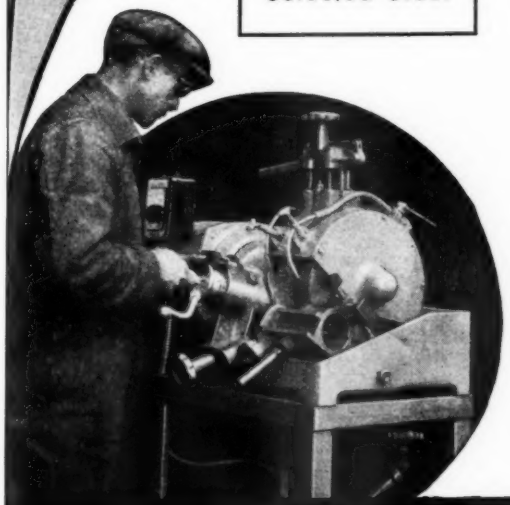

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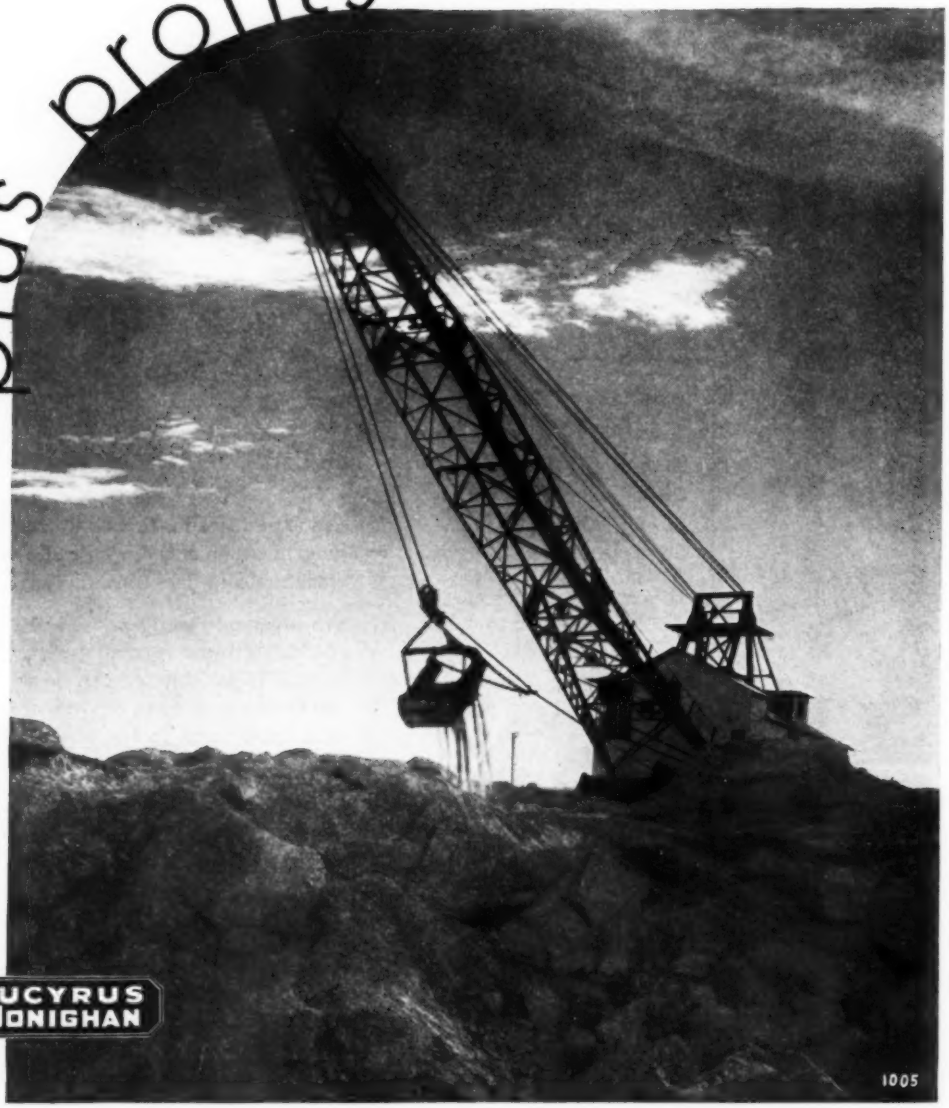
FAST, smooth operation ... plus minimum moving time; plus Diesel or electric economy; plus ability to operate over rain-soaked soil...soft, uneven, or obstacled ground; plus long life; plus low initial cost... add them all and you've got Bucyrus-Monighan high output with low costs. If you've a dragline job, there's a fast-digging Bucyrus-Monighan walking dragline that will help you make plus profits. Manufactured by Bucyrus-Monighan Company, Chicago, Illinois.

plus profits



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EXCAVATING, DRILLING, AND MATERIAL-HANDLING EQUIPMENT...SOUTH MILWAUKEE, WISCONSIN

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PUBLISHED MONTHLY
FOUNDED IN 1905

EXCAVATING ENGINEER

FOUNDED 1905

DEVOTED EXCLUSIVELY
TO EXCAVATION

About Excavating Projects — By Excavating Men — For Excavating Men — The World Over

Vol. 30 **MARCH, 1936** **No. 3**

Contents

3500 feet up! ..... **Front Cover**

Over Stevens Pass Highway, Myers & Goulter find beautiful going through this stand of Washington timber. The 37-B Bucyrus-Erie with Caterpillar Diesel power keeps a continuous stream of trucks moving with a fuel consumption of 70 gallons in 1¼ hours. The Diesel oil costs 7½ cents per gallon, bringing the cost per hour for fuel oil to 37½ cents.

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These interesting articles will appear in early issues of Excavating Engineer. Watch for them!

Building Fort Peck Dam

Dredging operations for the earth fill core, diversion tunnel construction, and the excavation for the spillway will be presented in a series of articles starting in an early issue.

Digging by "Stame"

The steam shovel, its origin, early use, and its development to 1880 will be presented in a fascinating series of authentic articles, beginning soon.

Confound the "Colecchi"

How Thompson-Starrett Co., Los Angeles, overcome difficulties in excavating cemented gravel "Colecchi" on the Colorado Aqueduct with two Bucyrus-Monighan draglines.

Published Monthly by **THE EXCAVATING ENGINEER PUBLISHING COMPANY, South Milwaukee, Wisconsin, U.S.A.**

F. O. WYSE
Managing Editor

ARNOLD ANDREWS
Editor

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D. B. REED, JR.
Assistant Editor

E. M. HEUSTON
Advertising Manager

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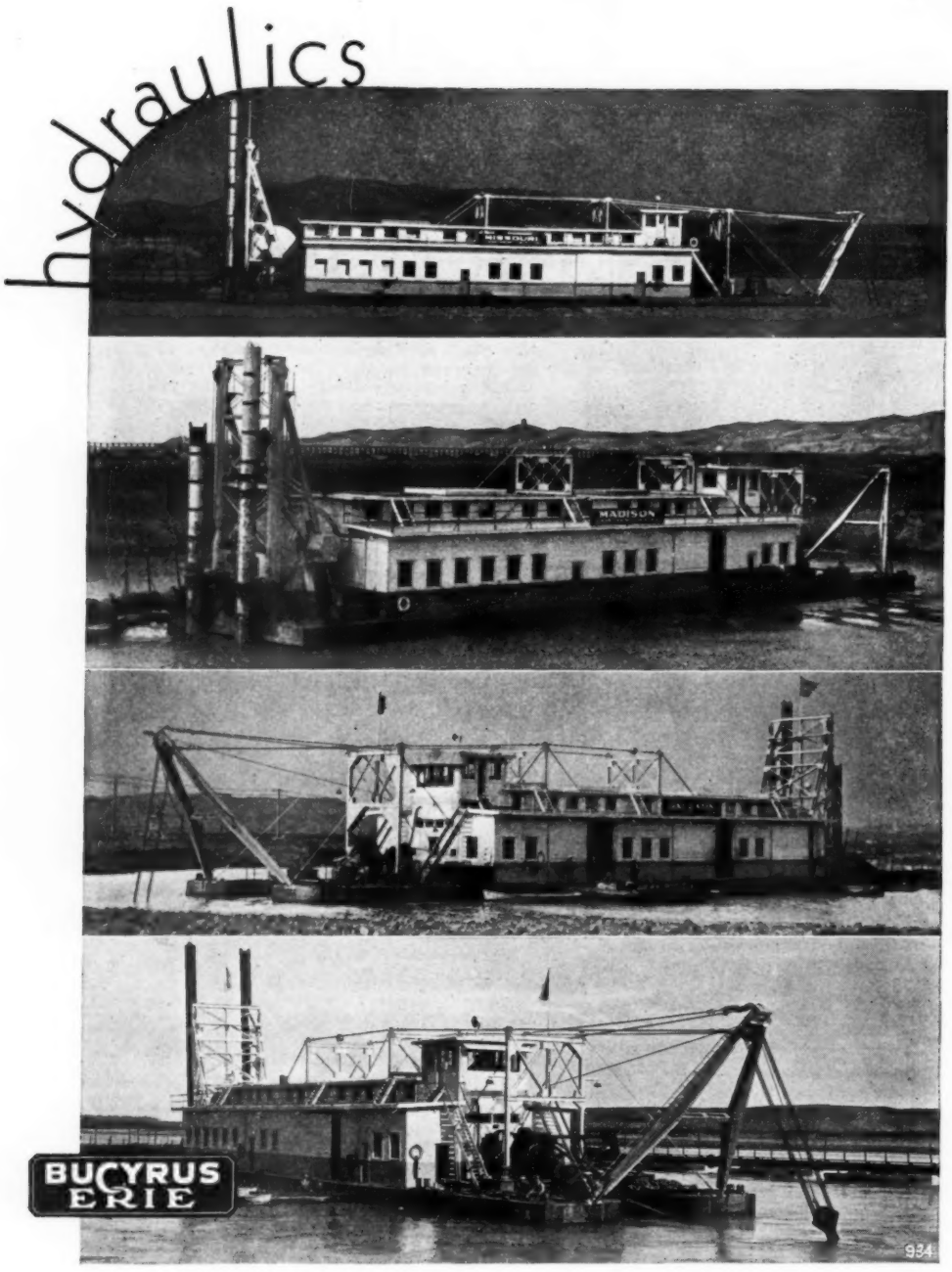

THESE four hydraulic dredges at Fort Peck Dam are built with Bucyrus-Erie pumps and digging equipment. On great hydraulic projects the world over, Bucyrus-Erie dredging equipment has proven its ability to give you bigger, steadier output, less delays, less grief, lower unit costs. Check into the savings Bucyrus-Erie dredges can make on your next job. Write:

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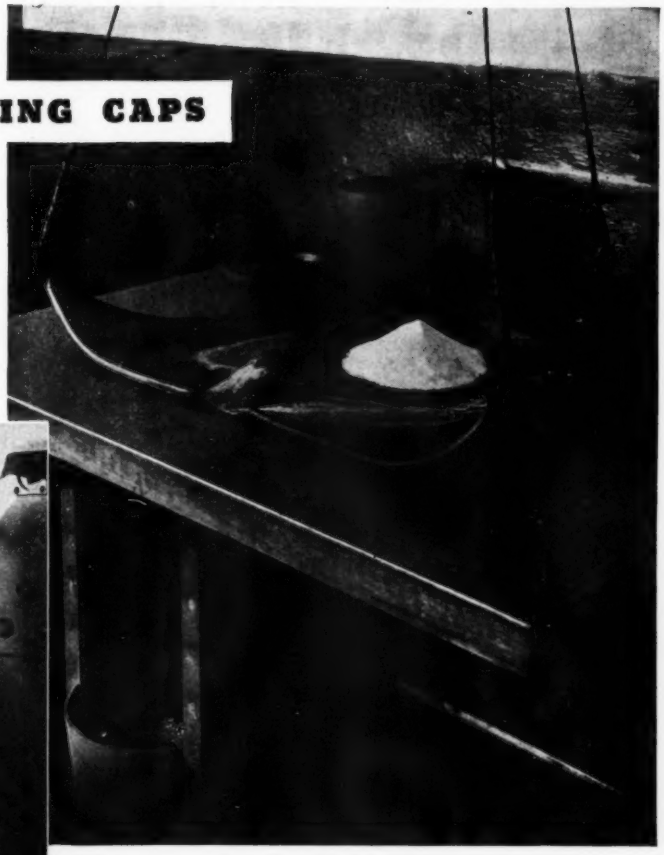
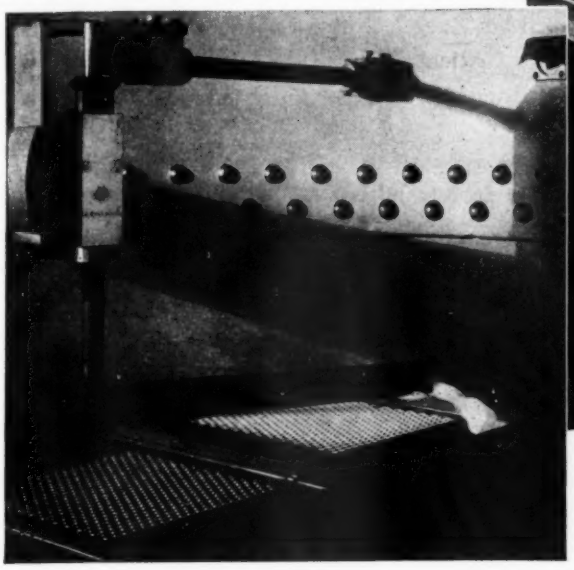
MAKING BETTER BLASTING CAPS



Small quantities of carefully selected and tested ingredients are thoroughly mixed by this device (modeled after the assayer's blanket), designed and used exclusively by Hercules. Impurities are removed by screening, and the resulting charge is then ready for use in the apparatus shown below.



Into the accurately bored chambers of the upper plate the explosive charge is evenly pressed and leveled off by a moving arm with two rubber edges. The lower plate containing the cap shells is then moved so that its openings are directly under those in the upper plate, and the exactly measured charges fall into the shells.

The *Extra* Margin of Dependability

We recognize a responsibility to produce blasting caps that will protect the large daily investment in explosives and attendant labor, and turn it into profitable blasts. To this manufacture we devote the utmost vigilance and all of the ingenuity and care of which we are capable.

Most important in a blasting cap is the explosive charge. We use the best ingredients and test them carefully. To mix them thoroughly, to measure the charges accurately, and to press them home evenly, we have developed special processes, some of which are described and illustrated above.

No matter what explosives you use, Hercules Blasting Caps will get the most out of them. Insist upon the Hercules label on all detonating devices. Mail the coupon for a catalog that describes them fully.

HERCULES POWDER COMPANY INCORPORATED 972 KING STREET, WILMINGTON, DELAWARE

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Electric Blasting Caps
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Please send complete information on Hercules Explosives and Blasting Supplies.

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Address _____

City _____ State _____

J-6

For your convenience in writing to Hercules Powder Company, you will find a card bound in this issue.

Not in the Contract

Jim: "I understand that a wife is a great help to a man."

Bill: "Yes, she'll stand by you in all the troubles that you wouldn't have had if you hadn't married her."

"Go to father," she said
When I asked her to wed;
Now she knew that I knew
That her father was dead;
And she knew that I knew
What a life he had led;
And she knew that I knew
What she meant when she said,
"Go to father."

Pearl: "It must be three years since I saw you last. My, how you've changed! I hardly knew you, you've aged so much."

Ruby: "Well, I wouldn't have recognized you in a thousand years, either. It was that dress that identified you."

Teacher: "Name a great inventor and his chief inventions."

Pupil: "Thomas A. Edison. He invented electricity. And then he invented the phonograph and the radio so people would stay up all night and use his electric light bulbs."

There is nothing like a budget to make you realize how much you spend for what little you get.

"Would you love me the same if Dad lost all his money, Charlie?"

"He hasn't, has he?"

"No."

"Of course I would, you silly girl."

Jones: "How is your son getting on at college?"

Smith: "He must be doing pretty well in languages. I just paid for three courses—$10 for Latin, $10 for Greek, and $100 for Scotch."

"Are you wearing spectacles, old man?"

"Yes. Through cross-word puzzles I've contracted an optical defect. One eye travels vertically and the other horizontally!"

Purchaser: "I'd like to get a pair of silk stockings for my wife."

Clerk: "Sheer?"

Purchaser: "No, I left her home."

COURTESY ED REED---THE REGISTER & TRIBUNE SYNDICATE

"How about watermelon for dessert?"

A motorist rapped at St. Peter's pearly portal, and, gaining entrance, St. Peter pointed out to him thousands of miles of golden pavement.

"Fine, beautiful highways, St. Peter," said the man, "but where are the automobiles?"

"Well, my dear motorist," said the gatekeeper, "I'm sorry to say you'll find all the automobiles below."

"Tough!" pouted the motorist, "but I'll stay with my car."

Before long he faced Satan at the other gate, within which were parked a score of high-powered autos. "Great!" he remarked. "Which one is mine?"

"Take your choice," smiled Satan.

He rapidly selected an attractive roadster and climbed behind the wheel.

"This is fine, Satan, now which way do I go and where are the roads?"

"There ain't any," remarked Satan, "That's the hell of it."

Mrs. Nextdoor: "Your daughter is so different from most girls: she's so sweetly sophisticated."

Mrs. Simon Pure: "She's all of that. Why, she thinks a B.V.D. is a university degree."

"I'se for a five-day week. How 'bout you, Sam?"

"Man, I'se for a five-day weekend."

Captain: "Don't give up the ship."

Passenger: "I haven't eaten one."

First College Boy: "Say, what's your hurry?"

Second Ditto: "I've got a date with a chiffonier and I'm late."

First C. B.: "A chiffonier? Say, do you know what a chiffonier is? It's a classy dresser with drawers."

Second: "Well?"

"Gosh, you're dumb. Why don't you get an encyclopedia?"

"The pedals hurt my feet."

"I can't see what keeps you women from freezing."

"You aren't supposed to, Big Boy."

AUSTIN-WESTERN has brought the elevating grader up-to-date.

Here are the facts. Decide for yourself whether this modern piece of equipment can give you more capacity loading or casting.

The plow and plow beam are controlled by a hydraulic stiff leg. Because of this unique control, the operator can shove the plow down to any desired depth, and the weight of the grader, as well as the plow beam, holds it there. Or if the operator prefers, the plow can be allowed to "float" beneath the weight of the plow beam as on conventional machines.

Because of this three wheel design, the greatest possible machine weight is placed just where it belongs—over the plow.

The furrow wheel, also hydraulically controlled, swings the front truck away from or towards the cut. Naturally, this action moves the plow in and out of the bank, for a narrow or wide cut.

These three features make it possible for the operator to control the depth and width of the cut at any moment, without the help of the tractor operator.

This absolute control means a full load all the time, and in order to carry the increased volume of dirt away, the conveyor belt has been troughed. It will handle all that the plow can dig, without spilling dirt over the side rails. This design feature and the speeding up of the belt to 475 feet a minute have solved the problem of increased plow capacity.

The plow beam itself is arched just ahead of the plow to insure against choking, regardless of material.

A year's experience in the field has shown new records for dirt moving in every part of the country.

Write for details or send the coupon.

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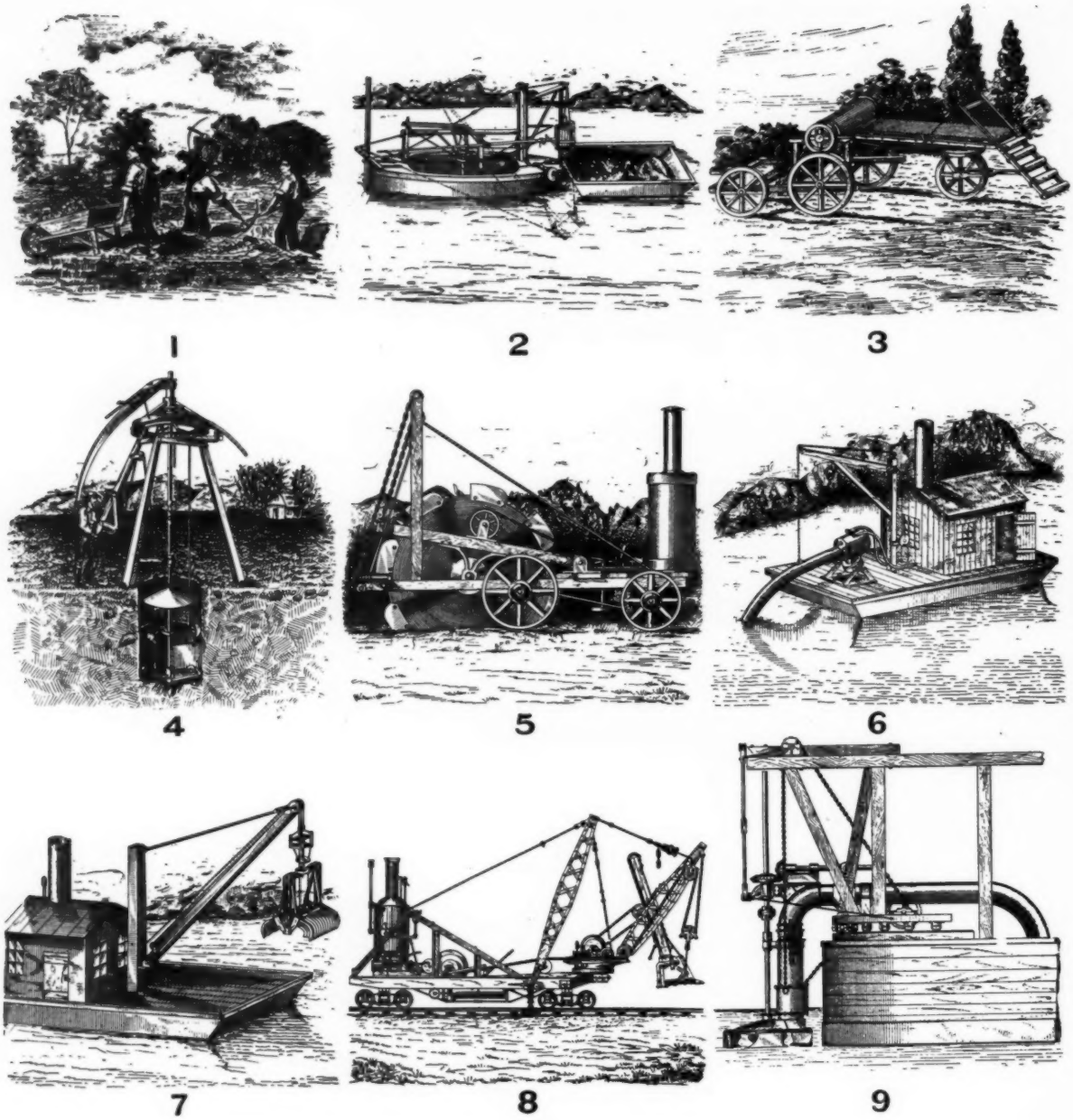


1. Primitive
2. U. S. Patent, Dredger—A. D. 1830
3. U. S. Patent, Excavator & Carrier—A. D. 1838
4. U. S. Patent, Well Borer—A. D. 1878
5. U. S. Patent, Tile Ditcher—A. D. 1881
6. U. S. Patent, Steam Vacuum Dredger—A. D. 1889
7. U. S. Patent, Clam Shell Dredge—A. D. 1884
8. U. S. Patent, Steam Navvy—A. D. 1884
9. U. S. Patent, Pumping Dredge—A. D. 1884

This print showing the evolution of excavators appeared in 1888 in a book called "The Growth of Industrial Art," by Hon. Benj. Butterworth, Commissioner of Patents. Compare these machines with those of today. The "evolution" didn't stop in 1888—and hasn't stopped in 1936.

Costly Fallacies in Plant Lubrication—

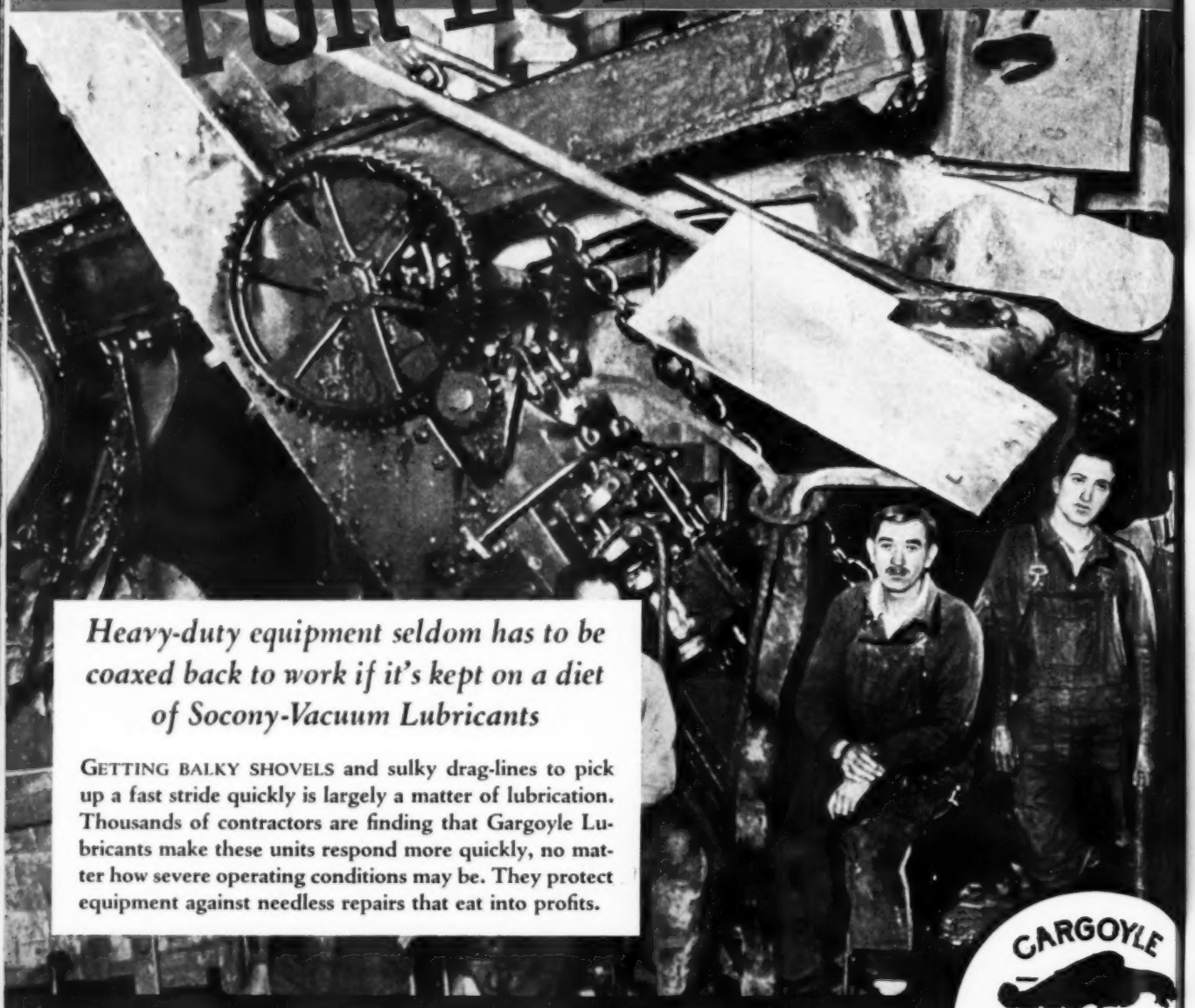
THERE'S A MAN IN YOUR PLANT TELLING YOU THIS RIGHT NOW:

"OIL IS OIL!"

SUCH AN IDEA is contrary to the scientific principles of correct lubrication. Oils must be just as different as machines and operating conditions. For 70 years the makers of Gargoyle Lubricants have sponsored "correct lubrication" by proving that "the *right* oil in the *right* place, in the *right* way" saves money. Thousands of plants—many in your own field—are using these principles successfully. The results they secure daily in reduced power consumption, more continuous production, decreased maintenance, lower lubrication costs are Socony-Vacuum's vital contributions to industrial progress.

ON THE NEXT PAGE
—A MESSAGE OF
TIMELY IMPORTANCE

TIME OUT— FOR LUNCH ONLY



Heavy-duty equipment seldom has to be coaxed back to work if it's kept on a diet of Socony-Vacuum Lubricants

GETTING BALKY SHOVELS and sulky drag-lines to pick up a fast stride quickly is largely a matter of lubrication. Thousands of contractors are finding that Gargoyle Lubricants make these units respond more quickly, no matter how severe operating conditions may be. They protect equipment against needless repairs that eat into profits.

GARGOYLE Lubricants

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EXCAVATING ENGINEER
MARCH, 1936 VOLUME XXX NO. 3

• *This fast digging dragline reinforces a highway on one of the levees protecting the Delta Region from the Sacramento River.*

Cleaning Ditches along the Sacramento River

Paris Brothers, Rio Vista, California, use lightweight Bucyrus-Erie ⅜-yard dragline to advantage on ditch work through soft ground

By D. W. EVANS

WHEN SAN FRANCISCO first achieved international fame back in 1849, it was because of abundant placer gold found in the sands along the upper reaches of the Sacramento River and the valleys of its tributaries. In those days, the waters of the Sacramento after passing the town of the same name, later to become California's capital, flowed through immense swamps on their way to San Francisco Bay.

Years later extensive reclamation projects, with miles of levee along the river's banks, and literally thousands of miles of drainage ditches, transformed this once dismal marsh land into the most fertile of farming country. All of this productive land lies in back of levees and below the level of the river. Seepage water is kept out by constant pumping. During irrigation season and in the summer it is only necessary to open a few valves to let the river water flow into the ditches for irrigation.

• *Left: A heavy growth of weeds clog the ditch and restrict the flow. Right: The ditch has been cleaned, opening the channel. It is on jobs like this that the lightweight ⅜-yard Bucyrus-Erie dragline shows to good advantage.*

Constant Ditch Maintenance Required

To protect these areas of farm land constant maintenance is necessary. Eroded levees must be reinforced. Weeds flourish in the

● *By spreading the caterpillar treads three feet, Paris Brothers made the 10-B range enough to straddle the 4- and 6-foot ditches. The two extra fuel tanks mounted on the rear of the machine provide sufficient capacity for thirty hours' operation.*

rich soil and soon tend to choke drainage ditches. And occasionally when flooding is permitted, to relieve levees elsewhere through the region, considerable restoration of the drainage system is necessary in the way of repairs to the levees, ditches, and roads. Highways maintained by the various reclamation districts, built for the most part along levees, sometimes slide or wash into the river, and must be bolstered up and regraded.

During the past 15 years, Paris Brothers of Berkeley and Rio Vista, California, have been engaged in this district, cleaning ditches, building roads, and doing other types of work necessary to preserve the drainage system.

Clean 4,000 Miles of Ditch

The Paris Brothers, Fred and Leon, started in business in 1914. A history of their contracts since that time would be a history of the bay area—building construction, streets, sewers, highways, canals, bridges,—jobs far too numerous to mention. They started handling reclamation district contracts shortly after the World War, and at present construct and clean 400 to 500 miles of ditches and canals every year. Fred Paris states that they have, since they started, cleaned more than 4,000 miles of ditches in the delta region within 25 miles' radius of Rio Vista. The drainage ditches run from a minimum of 4 feet in width up to the main canals 26 feet across.

During the present year Paris Brothers have been busier than usual. Normal weed growth requires ditch cleaning at least every two years, preferably each year. Because of depressed business conditions, many of the land owners in the Delta postponed the necessary maintenance work during the past two years. But recent improvement in farm income has now made possible renewed activity in restoring drainage systems to normal efficiency.

In fact Paris Brothers had so much work lined up that they found it necessary to add another machine to their equipment. For the work they had in mind for the machine to do, a lightweight digging unit, easy to move and fast digging, was particularly required. These requirements were met with the purchase of a Bucyrus-

● *Large wooden pads, reinforced with steel plates, greatly increase the bearing area and allow the machine to work in extremely soft ground.*

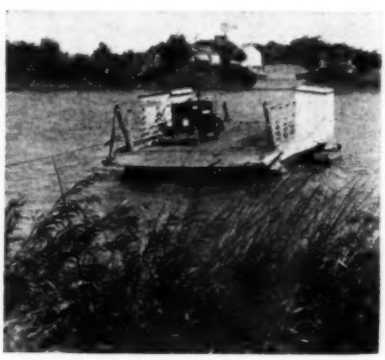
Erie 10-B ⅜-yard gasoline-powered dragline, weighing less than eight tons.

Machine Modified for Special Ditch Work

For their particular kind of ditch work, Paris Brothers found it desirable to make certain modifications on the standard caterpillar mounting of the machine as purchased. They installed longer axles increasing the width between caterpillar treads by 3 feet. On each steel caterpillar tread was mounted a 3-inch plank, 2½ feet long by 6 inches wide, with ¼-inch steel plate on the surface as a wearing plate. In addition to the standard 18-gallon gasoline tank, two extra tanks were fastened to the rear of the machine, providing sufficient fuel for a full 30 hours' operation. This allows refueling at convenient places where gasoline can be delivered.

So equipped, with greater bearing area for soft ground, with greater tread width to straddle small drainage ditches, with greater fuel capacity for around-the-clock operation, the 10-B dragline started on a busy career. In its first five months' operation the machine worked 3100 hours. This is exclusive of shut-downs for routine maintenance or greasing, and of the frequent barge trips and overland journeys while enroute to new jobs.

Actual operation of the Paris Brothers machines is directed by Superintendent Roy Kerns. In addition, he manages the very complete repair shop maintained by the company at Rio Vista. The modifications to the 10-B dragline were made at his suggestion, and he has designed and built a ⅜-yard dragline bucket and a ½-yard special V-shaped ditching bucket for use with it. This ditching bucket is shaped to conform to the ditch contour, and has special cutting blades to sever the tule along the ditch banks. For the larger ditches a ½-yard General dragline is used. It is equipped with a fork-type device operating on the principle of a clamshell bucket to pull out by the roots the weeds that infest the canals. All the work in connection with the building of the buckets and the

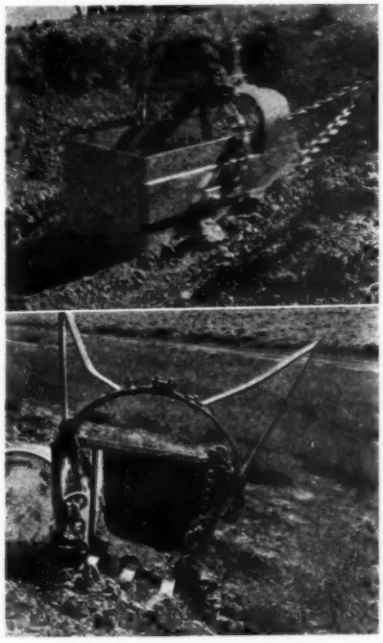


● *Another advantage of the 10-B is that it can be moved from island to island on the regulation auto ferry such as is shown here.*

changes made to the 10-B was done in the company's shop.

Asparagus Center of the World

Most of the productive farmland in the reclaimed Sacramento Valley is controlled by large and small land owners, many of them packing companies. In the neighborhood of Rio Vista all these concerns make use of the efficient Paris Brothers organization. Liberty Farms, Booth Canneries, Ryer Island Farms, Prospect Island Farms, California Packing Company, the Reclamation Dis-



● *Top: This special ⅜-yard bucket aids the 10-B in producing high yardages. Bottom: Superintendent Kerns developed this V-shaped ½-yard bucket with special cutting edges to remove weeds.*

tricts and many others put in their requests for ditch cleaning equipment.

While a variety of crops is grown in this part of the Sacramento Valley, the principal one is asparagus. More than 70,000 acres of rich farm land are devoted to this one vegetable. The "grass" as it is locally termed is sold fresh to nearby markets. Most of it is canned, and finds its way in this form into virtually every civilized country on the face of the earth. This valley is rightly

● *On levee building, ditch cleaning, or highway work, this Bucyrus-Erie 10-B produces big yardages and cuts costs.*

known as "Asparagus Center of the World."

Soft Ground no Handicap to Light Machine

The soil found in the island and valley farms near Rio Vista is none too firm to support heavy dirt-moving machinery. Because of this, the eight-ton Bucyrus-Erie dragline has a definite advantage as far as output is concerned when compared to the larger and heavier machines Paris Brothers also use on this work. Straddling the smaller ditches, or working close to the edge of the larger ones, the 10-B can get to work without delay, and can stay much closer to its work than can the heavier excavators. In any conditions yet encountered, it can work without mats which are necessary under the larger machines. It is estimated that one-third of the working time of the larger machines is used in handling these mats. An extra man is also required for these operations. In spite of its short boom and smaller bucket size the 10-B cleans up 600 feet of big ditch per shift, as much as the bigger units can manage. Moreover, its operating cost is ridiculously low—only two gallons of gasoline per hour, for example. The husky Hercules engine needs oil only at crankcase changes.

Low Maintenance a Feature

Furthermore, as much of the dragline's work is divided between islands and mainland, mobility is an extremely important asset. A ferry maintained by Liberty Farms for automobiles takes the little machine back and forth easily. The cost of hiring a barge to transport it to other islands is much less than for the larger machines.

Much credit for the performance of the 10-B dragline is due to the three fine operators who handle it. Gus Parrish, W. E. Colby, and Gerald Vierra are all experienced men in this type of work. While they keep the lightweight excavator whipping along without mercy, they get high outputs without abusing the machine. Thus on their standard rate of $125 per mile (where the ditch can be straddled) Paris Brothers know they can produce clean ditch at a rate satisfactory to the land owners without fear of high maintenance. There is a substantial profit in this work because the operators know how to handle their machine.

Copal—Aged for a Million Years

VAST TRACTS on the mainland coast of Zanzibar, once covered by primeval forests, now yield fossil copal or resin. Today not a single tree is visible along this coast, but at a depth of about four feet are valuable deposits of copal, formed from trees that lived a million years ago. Masses weighing as much as five tons are sometimes unearthed in one piece. Copal resin is used extensively in varnishes and electrical insulating compounds.

—*Westinghouse.*

● *Excavating 17th Avenue to the new grade is quickly done with this Diesel+Air shovel.*

Building a Grade Separation on Highway 80

Tanner-Hall Company construct highway underpass under the Santa Fe tracks at Phoenix, Arizona

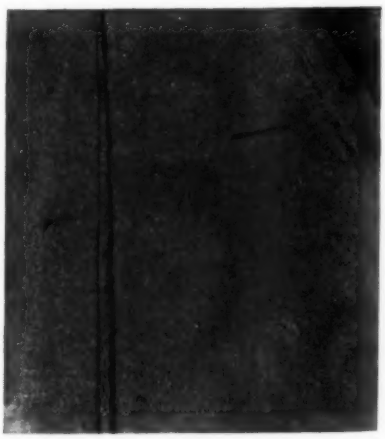
By **JOSEPH C. COYLE**

AN INTERESTING construction project was recently completed in Phoenix, Arizona, by Tanner-Hall Company, well known contractors of that city. The work involved the construction of a concrete underpass on 17th Avenue, which is a portion of Highway 80, and the main line of the Santa Fe railway. The railroad structure spans two 20-foot roadways and is supported by retaining walls, end walls and a central pier. Between the end walls and the retaining walls are 6-foot pedestrian walks. The subway itself consists of a 6-inch concrete slab and is 532 feet long including approaches. Excavation was carried to a depth of 18 feet. Included in this contract, which was financed by National Recovery funds, was the paving of two blocks of asphaltic pavement, 56 feet wide. Tanner-Hall Company were awarded the contract for $89,500. They started work last July, and completed it well ahead of scheduled time.

Railroad Structure Unusually Shallow

To reduce excavating costs as much as possible, Arizona State Highway Engineers designed the railroad supporting structure with a depth of only two feet. An unusually heavy mat of reinforcement steel was used in the concrete to handle impact and vibration stresses set up by the heavy trains using the span.

Construction was inaugurated by the railroad company by cutting the main tracks and employing a by-pass system so that the site could be cleared and excavation started. Tanner-Hall Company brought in their Bucyrus-Erie 1¼-yard Diesel+Air shovel, and quickly excavated that portion of the project. The waste was hauled away in 4- and 5-yard International trucks, to a spoil



● *The longitudinal expansion joints between slab and curb are filled with one-inch Carey "Elastite" expansion joint material.*

• *Left: The thirty-inch concrete pipe sections are lowered into place by means of a steel hook suspended from the shovel dipper. Right: The railroad structure, because of its shallow depth, required an unusual amount of heavy steel reinforcing.*

pile near-by, where it was stored to be used in backfilling later. An irrigation ditch ran through the site, and this had to be by-passed by means of a cast iron siphon. Surface water was removed with pumps.

With the excavation out of the way, forms were set up and reinforcing steel placed for the end walls, retaining walls, and pedestrian walks. Concrete was produced from a Koehring 13-E Paver, and hauled to the forms in rubber-tired Brown-Bevis concrete buggies. The footings of the retaining walls ranged in thickness from 8 inches at the end to 18 inches at the middle of the underpass, and were extended to form the pedestrian walks. With the walls in place, the railroad span was then constructed. Because of the large amount of steel reinforcement bars placed rather closely together, it was necessary to vibrate the concrete thoroughly with an electric vibrator. The surface of the slab was waterproofed with 1-inch asphalt planking, on 3-ply fabric impregnated with asphalt. The Hunt process of covering and curing concrete was used here.

Shovel Places Sewer Pipe

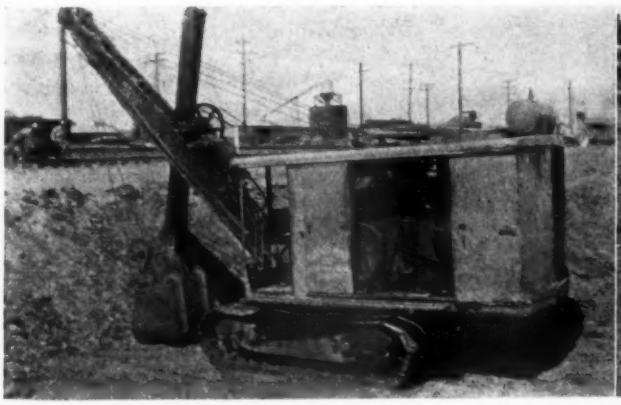
Another item involved in the construction of this project, was the laying of a 30-inch concrete storm sewer along the east end of the underpass. After the trench was excavated by a trenching machine, the concrete pipe sections were lowered into place by the Bucyrus-Erie shovel which carried a steel lifting hook suspended by chains from the dipper.

The next operation was the grading of the approaches and preparing the sub-grade. This was sprinkled and rolled with an eight-ton Austin tandem roller. Expansion joints with dowels were placed in the six-inch slab every sixty feet, with two contraction joints in between, making a joint every twenty feet. The pavement and curb were poured together with a longitudinal expansion joint, filled with one inch of Carey "Elastite" expansion joint material, just back of the curb. Another joint was made at the middle of the roadway.

As stated previously, this contract included the paving of two city blocks north of the subway to the width of fifty-six feet. Here the Bucyrus-Erie shovel excavated the road bed to grade. Scarifying was done with a Killifer ma-

(*Concluded on Page 141*)

• *Left: After the main railroad tracks had been removed, Tanner-Hall Company's Diesel+Air shovel removed approximately 13,500 yards for the underpass. Right: The spoil from the excavation was stockpiled nearby, and later used for backfilling. Shown here, the shovel loads to an International truck.*



● *Francisco Heights in San Francisco where "Pete" Farish did a quick job of excavation for a real estate development.*

Diary of a Dirt Digger

Wherein a Bucyrus-Erie Gas+Air shovel relates the tale of two months' grading on 60,000-yard real estate subdivision project

August 9. Moved in on a new job today. Can't tell much about it yet aside from two signs I noticed on the way. One, on a small building, read:

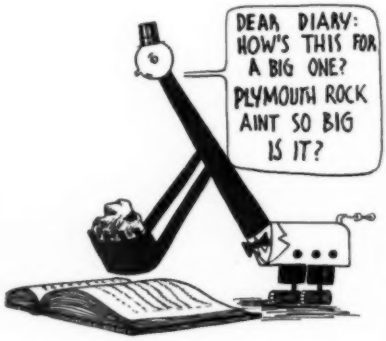
BUILDERS' OPPORTUNITY
FRANCISCO HEIGHTS
Sites for Apartments, Flats—Homes
Wide Lots
Low 1935 Prices
COLDWELL-CORNWALL & BANKER
Exclusive Agents

The other one, nearby, was:

FRANCISCO HEIGHTS
being developed by
THE FAY IMPROVEMENT CO.
Pavement Contractors
Highways — Streets — Subdivisions
ENGINEERS—SANBORN, CORINSON & CLIFT

August 12. Well, I know a little more about this job today. Heard my operator, Cliff Kent, talking with his assistant, Jack Seiders. Seems that my boss, Robert A. "Pete" Farish, has a 60,000-yard contract here to grade down three blocks for a new subdivision. I've been loading dirt into two Fageol trucks and a Sterling. Funny looking piece of ground here. All torn up as though there has been lots of digging going on. And there is a peculiar looking building here with a dome on top of it that I shall have to find out more about. They call it a Columbarium.

August 13. Got some more dope today. This used to be the Oddfellows' Cemetery. They moved out all the dead ones they could find. That building with the dome is where they are cremated. Must have missed a few of the old timers because I've dug up a couple of bones myself.



August 14. Not much doing for me today but those tractors sure have been busy. My boss has five of them here, mostly Caterpillars; three Diesels—a 35, 40, and 45—one gas 35, a 30, and an Allis Chalmers K. The 30, carrying a bulldozer, works on the dump, spreading the dirt dropped there by the trucks. Two others have bulldozers aboard too, and the rest haul scrapers. They raise a lot of dust but I can't see where they all together move half as much dirt as I do.

August 17. Finished our first week here today. Cliff Kent says we moved about 4,000 yards, and the scrapers moved 2,000. Have to do better next week. Been working into a high bank and

we're getting into some real good digging now.

August 21. Had to lay off a day on account of rain but we have been making up for it since. Cliff Kent can sure load out the trucks when he feels like it, and there aren't many shovels as speedy as I am.

August 24. Two weeks here now. Moved as much yardage this week as last in spite of that one-day shutdown because of rain.

August 26. Those scrapers have been having trouble with a lot of granite blocks down back of the Columbarium, so I've been over there straightening things out for them. Things are shaping up here now—begins to look like this place will make a bunch of nice lots. Different from that job on the Veterans' Hospital last year. That was just yardage—no variety.

August 27. Lots of fog lately. Seems like there hasn't been any sun for a week. That doesn't slow me up. Today we loaded 183 seven-yard truck loads in seven hours. Not bad for a 1¼-yard shovel.

August 28. Shallow digging today. Only got 168 truckloads.

August 31. Ended the third week today. Best yardage so far. The tractors got credit for 2400 yards but we moved 5600. Holiday Monday—Labor Day. The men get to go places but I just have to sit.

September 7. Somehow a week has skipped by since the last entry. I'm afraid I haven't been

● *From top to bottom: Operator Cliff Kent knows how to move dirt with this Bucyrus-Erie Gas+Air shovel — he loaded 183 trucks in one day. A Fageol truck dumps another 7-yard load on the fill. "Pete" Farish and his Engineer watch the Caterpillar 30 and bulldozer level off a hump. Behind the Columbarium three tractors true up the grade—at the left is a Caterpillar Diesel 45 pulling an Ateco hydraulic scraper, center, an Allis Chalmers Model K tractor and bulldozer, and at the right, another Caterpillar Diesel 35 with bulldozer filling in a hole. Note the grade being carried by Operator Kent in spite of the speed with which he loads trucks.*

• *Good teamwork here. With a 500-foot haul, three trucks manage to keep the shovel busy every minute.*

faithful to you, diary. But we have had a week of hard, steady work. Don't feel much like doing anything after five o'clock.

September 9. Cliff Kent's assistant, Jack Seiders, when he does a real good job of limbering up my joints sure puts me in shape for a good day's work. Last week was a short one, but the gang here put out 6500 yards. Job must be more than half done now. Today is a holiday for many but not for the crew here. It is called Admission Day and is the 69th anniversary of California's admission to these United States. With this job here half finished and another one like it in prospect it looks like times are picking up. We've been busy ever since I went to work for my boss a year and a half ago, and that's a good sign, but just the same you aren't quite sure 'till people start buying lots and homes. That, says Cliff, is a sure sign everything is O. K.

September 14. Rained out one day this week. If we ever got in a full week we could easily move 8,500 or 9,000 yards, at least if those tractors and scrapers would do their share. So far we have averaged close to 7500 yards a week of which these three trucks and I have handled about 5,000.

September 17. Football season opens the end of this week. Don't know whether the boys are paying more interest in that or the World Series or the Baer-Louis fight, but there is sure less attention paid to this job. Only 153 truckloads today.

September 19. Looks like we will have to do some scratching for dirt around here as they have raised the grade on one of the fills.

September 25. Boy, what a lot of headaches here today judging by the growling. Lots of the crew thought Baer would win last night. I hear them say "Now we'll have to work like hell to make money for bread and milk for the babies."

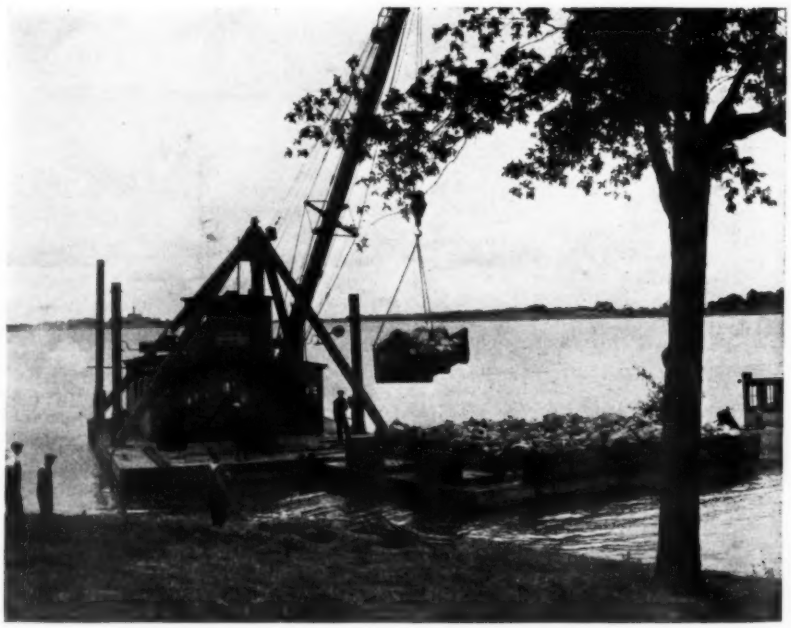
September 30. Tractors had more trouble this week with those blocks of granite and I had to go down and help them out. Bettered 8,000 yards last week in spite of having to take time away from the digging.

October 2. World Series starts today. If the men keep their minds on the job, this starts the last week on this job, too. The four tractors are putting the finishing touches on that chewed-up piece back of the Columbarium.

October 3. Started the last stretch of digging here today along the north wall of the old cemetery. Couple of the men are starting in to tear the wall down.

October 9. Wound up this job today. Placed 60,000 cubic yards in two months, to a day, including grading of lots and two cross streets. The City is to complete the grading and paving of Anza Street through the tract. Tell any real estate men you know, this grading crew will put through any projects they have in mind, with speed and accuracy. Get in touch with Robert A. Farish, 14 Pinehurst Way, San Francisco, California. So long, folks!

Pure Water for Springfield



• *Springfield, Illinois, now enjoys water without disagreeable taste and odor from their new purification plant constructed as a PWA project. The illustration shows workmen placing rip rap along the banks of the reservoir to prevent erosion and to help keep the water clear.*

Old Times and Old Timers

When Riggers were RIGGERS

SEVERAL interesting photographs and a good "Old Timer" story arrived recently from reader F. H. Eastman, Vice President and General Manager, Gannett, Eastman & Fleming, Inc., Engineers, Harrisburg, Pennsylvania. He writes that as is his custom upon the arrival of Excavating Engineer, he assumed a comfortable do-not-interrupt position and started reading. His letter follows:

"The particular section that always interests me is 'Old Times and Old Timers,' and when I read 'An Incident on the C. & O.' I harped back in the archives of my memory to remember where I had seen something like that before. It finally dawned on me, and I got my photographic records of jobs of bygone days and turned to a job on which I was superintendent at Westfield, New Jersey, which constituted putting an underpass under four main line and two siding tracks of the Central Railroad of New Jersey during the war period in 1917 when the B. & O., Pennsylvania and other railroads in the East were running troop trains over that section of the tracks.

"It was a hurry up job, but this particular morning I had to go to the New York office and was late getting out, my train arriving at the Westfield Station at 9:15. I found the job going along as usual, but three days later the shovel runner on the 'Little Giant,' showed me some photographs which I kept and which I enclose.

"The morning in question, he started out at 7 o'clock to dig, having moved his shovel ahead and put his jacks down at quitting time the night before, but when he swung around with the first bucket, one jack arm quietly and peacefully disappeared below ground and the shovel turned over on its side. The reason was, that when he moved ahead the night before, he set his jack arm up directly over a cesspool which had been built before the days of sewers and covered over and forgotten. The first thing the operator did was to get his camera to prove that the shovel actually tipped over, then he thought better of it and decided to save himself a bawling out, and to get it straightened up before I got there. This he did in the period between 7 and 9:15 when my train arrived, with very little help from anybody except his fireman which shows that even in those days we may not have had modern equipment but we sure had riggers."

Many thanks for this interesting story, Mr. Eastman.

From an Old Timer in Santa Domingo

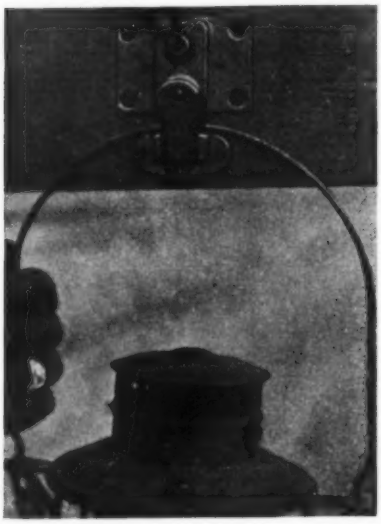
A QUESTIONNAIRE sent out sometime ago to our readers in Central America and the

(*Continued on Page 159*)

Field Notes

Handy Lantern Holder

A LANTERN when not in use is generally hung up out of the way wherever it is possible to drive a nail upon which to hang it. Under such circumstances the lantern is too often "lifted" by well intentioned borrowers who delay or even forget completely to return it. The illustration above shows a simple way of preventing such borrowing. Remove the lock and latch from an old pasteboard suitcase and nail or screw it firmly, in an inverted position, to the spot where the lantern is to be kept. The lower side of the latch tongue may have to be filed or ground a trifle to accommodate the bail or wire handle. The latch holds the lantern handle securely and can of course be locked if desired. There is nothing to catch the clothing or fingers, as in the case of a nail, and it can for that reason be located almost anywhere. The arrangement too, is very convenient for holding a warning or safety lantern wherever needed for safety purposes.



—F. W. Bentley, Jr.

A $40,000 Legal Lesson

WHEN a corporate contractor did extra blasting and excavating it unwittingly blasted its chances of collecting $37,304 for the work. Then it spent more money in a futile effort to collect.

The contractor's loss in this case resulted from failure to observe two simple rules of law with which every excavating contractor should be familiar: (1) Provision of a contract, to the effect that the contractor shall file a written statement covering extra work in order to be entitled to be paid therefor, is mandatory. (2) A supervising architect has no right, by virtue of his relation to the owner, to waive compliance with contract provisions.

In this case—Crane Construction Co. v. Commonwealth, 195 N. E. 110—decided by the Massachusetts Supreme Judicial Court, plaintiff contracted to erect a $239,500 hospital building for the commonwealth. The contract contained this fatal clause:

"The contractor shall do any work . . . when and as directed in *writing* by the Architect. . . . If the contractor claims compensation for extra work not ordered as aforesaid, . . . he shall, within one week after the beginning of any such work . . . make a written statement of the nature of the work performed . . . to the Architect, and shall, on or before the 10th day of the month succeeding that in which any such extra work shall have been done . . . file with the Architect an itemized statement of the details and amount of such work; . . . and unless such statement shall be made as so required, his claim for such compensation shall be forfeited and invalid, and he shall not be entitled to payment on account of any such work."

While plaintiff was excavating for the foundation, the architect wrote a letter to plaintiff asking a price for blasting certain additional areas of ledge. These areas were described in general terms. Plaintiff answered that the price for rock excavation would be $7 per yard. The architect replied that the price had been approved and that he would go over the site with the contractor's representative. That is all there was in writing to bring the extra work within the provision of the contract clause above quoted.

Later the architect and the contractor's representative staked out a line and the architect *orally* directed that this extra work commence. Still later he orally directed extension of the line 25 feet.

When the contractor sued for extra compensation at the agreed rate of $7 per yard, the trial judge ruled that the architect's letters did not amount to a direction to proceed with the extra work, and that plaintiff contractor had failed to comply with the conditions of the contract entitling him to extra pay.

The Supreme Court upheld the decision, saying, in part:

"It is apparent that the letters did not constitute a completed contract before the parties met on the site and had a further conference. . . .

"We are also of the opinion that the finding of failure of the petitioner [contractor] to make a written statement to the architect of the nature of the work performed, within one week after the beginning of the work, and to file with the architect, on or before the tenth day of the month succeeding that in which the work was done, an itemized statement of the details and amount of such work as required by . . . the contract, precludes the petitioner from recovery. *It is plain that the architect had no authority to waive these provisions of the contract.* . . . The finding of the judge that for this reason alone the petitioner was precluded from recovery on the second claim was correct.

"Although it seems a hardship for the petitioner not to be able

These Days

I saw the bottom of a bay
Built up into a shore.
I saw a river straightened out
Until it wound no more.
I saw a mountain tunnelled through,
A hillside levelled down,
A road built underneath a stream,
One underneath a town.

I saw a hilly townsite made
As level as a floor.
I saw a lake in beauty spread
Where there was none before.
I saw a landscape rearranged
In perfect symmetry.
The earth these days is going in
For plastic surgery.

—Clarence Edwin Flynn

to recover for the extra work which apparently it performed in good faith, yet such failure results from its not obtaining from the architect or his agents written authority to perform the work, and from not complying with the other provisions of . . . the contract."

—Arthur L. H. Street, Attorney-at-Law.

Silicosis in Construction Work

THE QUESTION of occupational diseases and prevention thereof has been receiving an increasing amount of space in the press of late. Of all the known occupational diseases, it is probable that silicosis is the one which offers the greatest hazard in certain construction operations. Silicosis may be defined as that disease of the lungs caused by the victims breathing in silica dust. In its final stage the disease is incurable and therefore the emphasis must be placed on prevention.

The danger from exposure to silica dust varies from a few months to several years. Some of the construction operations that offer silicosis hazards to workmen may be listed as follows:

Hard rock tunneling and drilling,
Rock quarries and crusher plants,
Sand pits,
Blasting operations—both surface and underground,
Grinding room operations.

Unless proper preventative measures are taken, free silica dust is produced by all of these operations and thus the workers are exposed to the hazard of silicosis.

In hard rock tunneling and drilling, one of the best preventatives is to keep all surfaces wet, not only at the immediate site of the operation but also in the nearby vicinity. Wet drilling should be used. Before a blast is fired, tunnel walls at and near the blast should be wet down. The tunnel floor for some distance should be wet. This will prevent the jar of the explosion from stirring up myriads of dust clouds. Adequate ventilation is also necessary in order to keep the men supplied with a constant supply of fresh air, free from silica dust. In dry drilling, there may be used a rather complicated and somewhat expensive system with the intakes at the shank of the drill at the surface of the rock. This requires a suction piece for each drill, connected by hose to a central exhaust plant. The silicosis problem has medical and legal phases which space does not permit to discuss here.

Summing up, contractors especially those engaged in tunnel and quarry work, must appreciate the importance of the elimination of this hazard in their operations. The recommended preventative measures are enumerated below:

1-Exert every effort to reduce dust hazards.

2-Keep theatre of operations wet so as to permit a minimum of dust in the air breathed by the men.

3-Use wet drilling where practical and possible.

4-Use of respirators.

5-When dusty operations are confined and are of appreciable magnitude and duration to warrant the expense, install ventilating systems.

6-Require medical examination of all prospective employees before putting them to work at occupations exposed to dust hazards.

7-Check the health of men at frequent intervals. Those showing signs of silicosis should be removed from dust exposures at once and placed where clean air is afforded.

8-Don't expose men to dust hazards if their lungs are weak or if they are in the least tubercular.

9-Recognize the fact that occupational diseases are not mythical — they are a serious reality and must be treated as such.

—Welton A. Snow in Construction Safety.

Emergency Pipe Line Packing

ON CONSTRUCTION work it is often necessary to use the material at hand in an emergency regardless whether it is exactly the thing to be desired. There was a pump rigged up on the river bank to supply water to a power plant during some construction work on a new pumping plant. Due to the river stage changing it was necessary to change the suction and discharge line rather frequently. Finally all the rubber packing for gaskets in the flanged joints of the suction line was used up. It happened that half a roll of ordinary black tar paper used for roofing the construction office was left over together with some of the black tar used at the seams. Gaskets were cut of this paper, smeared liberally with the tar and placed in service. This type of packing gave less trouble than the other and its use was continued throughout the rest of the time that the pump was operated. When the lines were shifted the paper was simply thrown away and a new gasket cut to fit.

— K. B. Humphrey

Simple Post Puller

PULLING CRIBBING by hand is simplified by the use of a strong wooden lever, several feet long, and reinforced at one

end by heavy strap iron, with a turned up fork in the outer end, which projects beyond the wood. This fork grips the links of a chain to which is attached a U hook that slips around the timber to be pulled. A long trestle is used as a fulcrum for the lever, so as to avoid frequent moving, and make it easy to straddle ditches, etc. The lever, resting on the trestle is simply moved up and down as the timber comes up, the hook dropping by gravity each time the back end of the lever is raised. A short rod through the lever near each end aids in carrying it about.

— Joseph C. Coyle

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F. O. WYSE
Managing Editor

ARNOLD ANDREWS
Editor

D. B. REED, JR.
Assistant Editor

A. R. TOFTE
Assistant Editor

E. M. HEUSTON
Advertising Manager

The Business Situation

IT HAS BEEN a good many years now since some misinformed person started the misconception that presidential election years were bad years for business. The reason usually given for this statement is that the unsettled political situation begets a certain business caution that actually slows up business.

It is usually true that political uncertainty has a retarding effect on business, but the conception that a presidential election year is bound to be a bad year is erroneous because there are many and much more powerful factors active in determining the course of business at any time.

If we were to look back over the history of our country and discover that half of the election years have been good and half of the election years have been bad, we would be inclined to say that this political influence on business was of minor importance. However, when we look back over the history of the United States we find that of the 36 presidential election years since the inauguration of George Washington as president, 21 have been years of better than normal business activity and 15 of them have been years of depression. This is in spite of the fact that the normal line, used to determine the relative course of business, is such that examination shows 50 per cent of all years to be good years and 50 per cent to be years of depression.

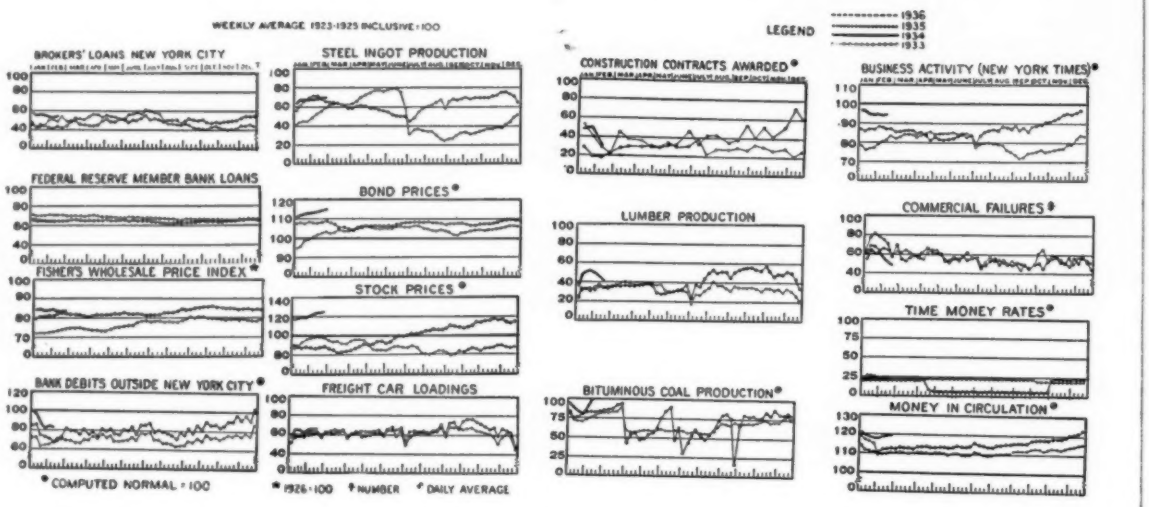
Looking still further we find that of the 26 presidential years included in the last 105 years, 15 of them have been years during which business activity at the close of the year was better than it was at the beginning of the year.

Opposed to these records of history we have the incontrovertible fact that events have crowded into the first few weeks of this year more threats of political uncertainty and of changes in our monetary set-up than we would normally encounter in several years. We refer, of course, to such things as the enactment of the bonus, such court decisions as those unfavorable to the A.A.A. and favorable to the Tennessee Valley Authority, the various bitter political speeches that have been delivered to immense audiences on the radio, by both sides, and the rumors of plans to establish open market for gold and silver. The answer to this seems to be that the widely distributed improvement in business activity during the second half of 1935, since the elimination of the N.R.A., has created a momentum which will take a considerable force to stop it. Each business depends upon other businesses to such an extent that inertia and business sentiment are two very important factors in the speed with which business changes. In addition to this, at the present time, the natural forces for the increase of business are strong enough to offset the effects of many less important and adverse factors. By natural forces we mean, for example, the tremendous volume of idle funds waiting to seek investment with reasonable safety and the tremendous need for equipment from the heavy industries, brought about by the obsolescence of equipment which has not been replaced for many years beyond its normal life.

It seems, at the present time, as if the year 1936 would be a year of better business activity than the year 1935, in spite of the fact that it is a presidential election year.

Construction continues to be undertaken in a volume substantially in excess of the level of last year. For January a total of $204,792,800 was reported by F. W. Dodge Corporation for construction undertakings of all types in

WEEKLY BUSINESS INDICATORS



the 37 states east of the Rocky Mountains. This compares with only $99,773,900 for January, 1935 but represented a decline of about 22 per cent from the total of $264,136,500 reported during December, 1935.

Improvement over January, 1935 totals was recorded in each of the 13 major geographic areas east of the Rockies without exception. The largest relative gains were registered in the Middle Atlantic states, the Chicago territory and Southern Michigan.

For residential building alone the Dodge organization reported a January, 1936 total of $37,439,500 as against only $22,410,200 for January, 1935 and $45,140,100 for December, 1935. Gains in residential building over reported totals of a year earlier were shown in each major geographic district, except the Southeast.

For non-residential building the January total for the 37 eastern states amounted to $90,479,800; this was almost three times the total of $32,958,400 shown for January, 1935 but was considerably below the December figure. The January, 1936 volume of heavy public works and utilities construction amounted to $76,873,500 and contrasts with only $44,405,300 for January, 1935 and $94,490,400 for December, 1935.

Thoughts for Executives

A GREAT business success was probably never attained by chasing the dollar . . . but was due to pride in one's work—the pride that makes business an art!"

So stated Henry L. Doherty of the Cities Service Co., in commenting on the misconception in and out of the world of business that every business man must be a "money-grubber" to reach the top.

Every business man knows that to attain success he must keep working toward one goal—but many think of that goal in dollars and cents. A great banker recently observed that the happiness coming from a job well done is worth more than all the dollars a man could ever amass . . . particularly when that happiness is brought about by success in bringing happiness and a better life to one's fellow human beings.

"The ultimate aim of all industry," explains Charles F. Kettering of General Motors, "is for a better life—better living conditions, better health, better food, better government, better houses, in fact, for better everything. And these can come about only in proportion as our daily routine and activities conform more nearly to nature's laws, which we understand so poorly at the present time."

The man who goes forward with something more than "money-grubbing" in his thoughts generally not only attains financial security but a happy, contented life well worth the living.

True, all think in terms of money, but thinking in terms of money as something to possess, or as something with which to accomplish a bigger and more helpful life, are two different things. — ***Ernest W. Fair.***

Ancient Ways in Modern Days

THIS STEAM MACHINE is loading nickel ore at Bornet on the island of New Caledonia, about 1000 miles east of Australia in the Pacific Ocean. The ore is loosened by hand, picked up by the chain of small buckets, dumped through a central hopper in a retaining bin, and thence into the dump cars shown in the foreground. The ladder can be adjusted to work at different levels, and the machine moves parallel with the ore pile on wide gauge tracks. Operation seems to require a crew of nine men and a boss. In contrast the last word in modernity is suggested by the power cables on steel frames in the background.

Grade Separation on Highway 80

(*Continued from Page 133*)

chine drawn by a Caterpillar "Thirty." A Caterpillar patrol blade then worked over the subgrade, leveling it off, after which the subgrade was sprinkled and rolled with a 12-ton Austin roller. A six-inch stabilizing base course was placed and rolled, and followed by two courses of black topping a four-inch base course, a two-inch top course, finished off with a thin sprinkling of fine aggregate. Asphalt Grade D was used in the plant mix.

The final operation was placing the necessary backfilling, which was handled by the shovel loading to trucks.

Tanner-Hall Construction Company is composed of R. C. Tanner; W. E. Hall; Rule Simons; and B. L. Willis. W. L. Johnson was Construction Superintendent for the contractors on this job.

For the Arizona State Highway Department; R. C. Perkins is Division Engineer, in charge of construction; George Lang is Resident Engineer, and Eugene Gilpin, Assistant Resident Engineer. R. A. Hoffman is in charge of bridge design and supervision.

"Why does a red-headed girl always marry a quiet guy?"

"She doesn't. He just gets like that."

EQUIPMENT

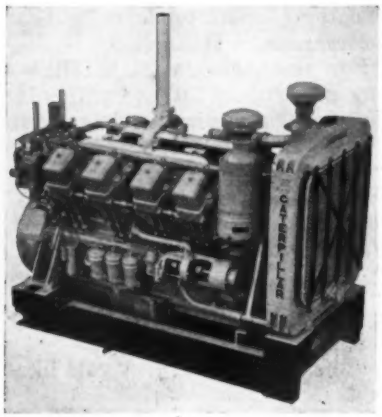
You Ought to Know About

New V-8 Diesel Engine

EXPANDING the range of power in its Diesel engine line, Caterpillar Tractor Company of Peoria, Illinois, announces three new models: the D 17000, V-type, 8-cylinder, 160-horsepower; the D 6600, 3-cylinder, 60-horsepower; and the D 4400, 4-cylinder, 44-horsepower. These three, with the present 6-cylinder D 13000 of 125 horsepower and the 4-cylinder D 8800 of 77 horsepower, comprise the company's current Diesel engine line. Of the newcomers, the D 6600 is in general production and shipments of the D 17000 and D 4400 will begin about March 15, according to the announcement.

The D 17000 is the outgrowth of a demand for increased power by users of larger engines who had observed the success of the company's Diesel line. To fill these requirements, an engine of V-type design was chosen, and is declared to be ideally suited where this compactness is needed, such as in shovels, industrial locomotives, compressors and crushers.

The D 17000 is a true Diesel engine, 4-stroke-cycle, valve-in-head, water-cooled, and features solid injection of fuel into precombustion chambers. Bore and stroke are 5¾" x 8", and the governed speed is 850 r. p. m. The 8 cylinders are in two groups of four, set at an angle of 60 degrees. Cylinder heads are cast separately, facilitating removal or replacement. Cylinder liners, of heat-treated chrome-nickel alloy cast iron, are removable, and the cylinder blocks are cast in pairs.



The fuel injection system is similar to that of all Caterpillar Diesels. A single row of eight individual fuel pumps is conveniently located between the cylinder banks, and all fuel lines to injectors are the same length. Lubrication is of the forced feed type. A 28-hp. 2-cylinder gasoline engine, mounted at the rear of the engine, over the flywheel housing, supplies the necessary power to start the big Diesel engine. The D 17000 unit, fan-to-flywheel, weighs 7,150 pounds, and equipped as a power unit with radiator, base, and accessories, 11,500 pounds.

Although similar in general construction and operating principle to the other Diesel sizes, the 44-hp. D 4400 engine differs widely in several respects. It weighs only 2300 pounds and as a complete power unit, 3740 pounds. Bore and stroke is 4¼" x 5½" with a governed speed of 1400 r. p. m., and starting is handled by an independent gasoline two-cylinder engine.

Next above the D 4400 in power is the 60-hp. D 6600, which has the same bore, stroke and governed speed as the next three larger Diesel units. It will power a 30-KW generator, a ¾-yard shovel, and a wide variety of jobs in industry and construction.

Complete information regarding these newest additions to Caterpillar's line of Diesel engines may be had by writing the manufacturer, which may be done conveniently by using one of the handy post cards bound in this issue.

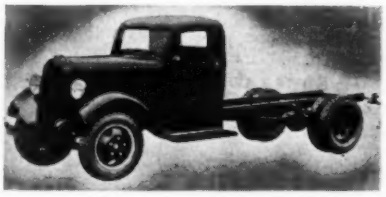
Dodge Announces 1936 Trucks

FEATURING "fore point" load distribution, hydraulic brakes, and "pre-proved" economy, Dodge Division of Chrysler Corporation announces a new series of trucks and commercial cars for 1936. This new line will consist of the following chassis models: ½-, ¾-, 1-, 1½- (in two series), 2-, 3-, and 4-ton models. Specially built custom Airflow models also will be offered.

Among the important innovations, states the manufacturer, marking this new line of trucks is the "fore point" load distribution, through which the load is shifted forward in relation to the axles. This insures greater stability, a minimum of over-all length, more nearly equalized wear on brakes and tires and in general, a more efficient hauling unit.

Emphasized for 1936 is "pre-proved" economy in both the operation and maintenance of Dodge commercial cars and trucks in which gasoline and oil economy play so vital a part. Outstanding fuel and oil economy have been developed through six major mechanical features and advantages. They are: Aluminum alloy pistons, four piston rings, full length water jackets, valve seat inserts, spray cooled exhaust valve seats and special oil cooling.

The 1½-ton models, shown in the accompanying illustration, are furnished in 129-inch, for dump bodies, 136-inch and 162-inch wheelbase lengths, and in two series of 9,500 and 11,500 pounds gross rating capacities, powered by 70-hp. engines.

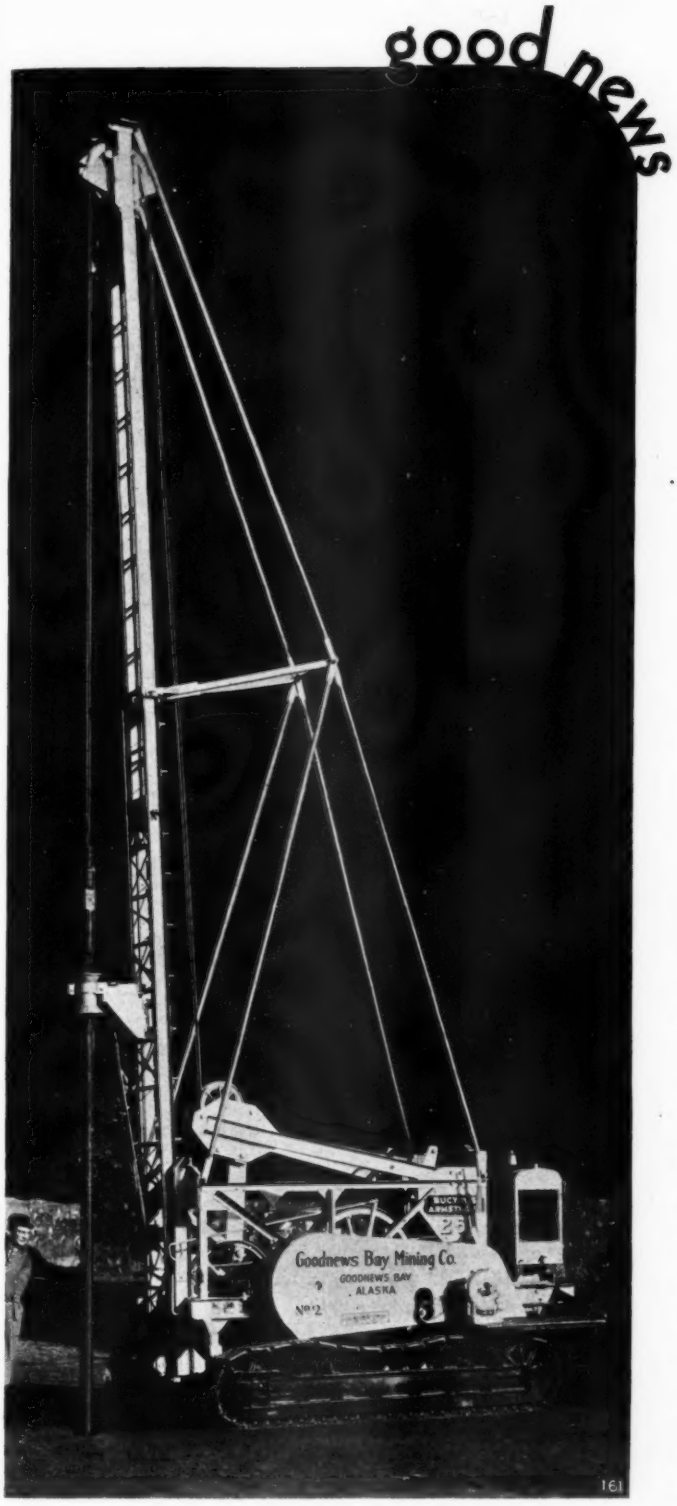


The rear axle housings of Dodge 1½-ton trucks are made of one piece of seamless steel expanded at the center for mounting of the rugged differential carrier assembly and contracted at the outer ends to accept the large wheel bearings. The brake support and spring seat is electrically welded to the one piece housing, after which the entire housing assembly is heat treated. Full-floating construction is used.

Portable Arc-Welding Unit

JOB WELDERS, pipe line contractors, steel erectors, repair shops and other arc welding users to whom portable welding equipment is a necessity, can now install an arc-welding generator on any standard 1½-ton truck and drive the welder direct from the truck motor. This is made possible by a power take-off developed by The Hercules Steel Products Company, Galion, Ohio, in

(*Continued on Page 163*)



IT IS always Good News when a Bucyrus-Armstrong prospecting drill arrives on the job... but it was especially appropriate when the Goodnews Bay Mining Company of Alaska put a new model 26-P at work. This up-to-date, high-speed, mobile drill makes modern prospecting easier, faster, and more dependable. Full-length crawlers, machine-cut gears, rubber-cushioned wire-line shock absorbers, and a wide margin of reserve in strength and capacity make Bucyrus-Armstrongs the ideal prospecting drills. Send today for complete information about the 33-P and 26-P drills... built specifically for prospecting work.

BUCYRUS ARMSTRONG

BUCYRUS-ERIE

EXCAVATING, DRILLING, AND MATERIAL-HANDLING EQUIPMENT...SOUTH MILWAUKEE, WISCONSIN

For your convenience in writing to Bucyrus-Erie Company, you will find a card bound in this issue.

WISCONSIN GOE

SNOW-BOUND STATE RELIES ON A-C POWER IN STORM CRISIS

89% OF TRACTORS PURCHASED ARE ALLIS-CHALMERS! . . .

WHEN the real test came—Wisconsin dug out with Allis-Chalmers tractors. This was one of those "old fashioned" winters—raging blizzards . . . heaviest snowfall in a generation . . . fierce, shifting winds . . . treacherous drifts . . . temperatures down to 52 below. Equipment was taxed to the limit—none but the best could stand the test. It was no time for second-best machinery. That is why Wisconsin public officials specified Allis-Chalmers—33 A-C Tractors during those three trying weeks . . . compared to four units of other makes.

WHEN DEPENDABILITY COUNTS — When highways are blocked, business stops. Milk, foodstuffs and coal cannot go through. Dependable equipment — to keep the roads open — pays for itself many times over.

POWER — It takes real power to buck big drifts. Where trucks and smaller tractors were helpless — A-C's plowed through.

DURABILITY — Less rugged equipment went to the shop for repairs — caused by the stresses and strains of heavy drifts against the plows. Under tests like this — A-C quality proved itself.

INSTANT STARTING — Only A-C Controlled Ignition Oil Tractors offer this advantage — instant starting on Diesel fuel oil, regardless of weather.

QUICK MANEUVERING — "Light on its feet" as well as powerful — able to turn in its tracks in close quarters. The operators appreciated this feature in A-C's.

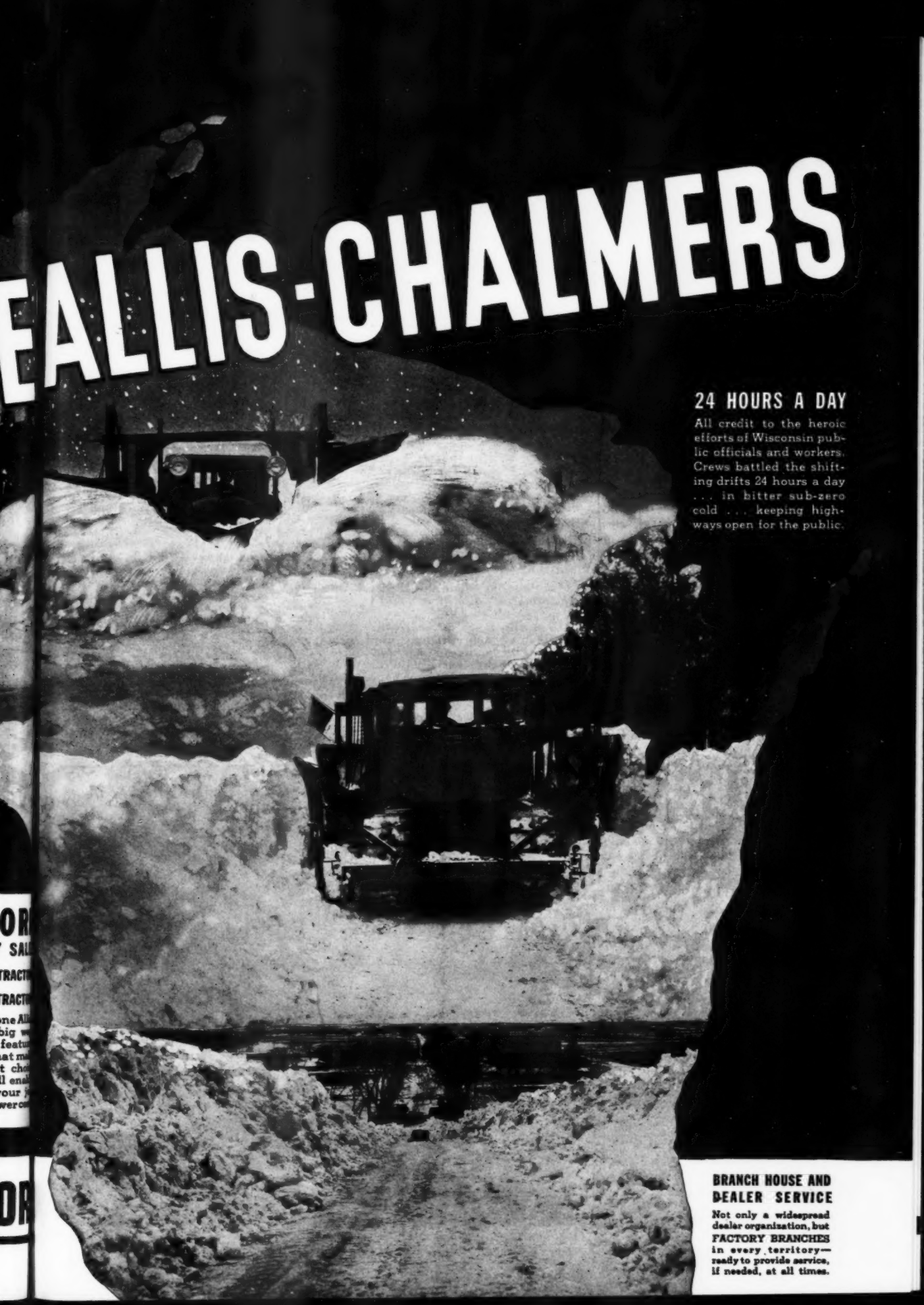
TRACTION — There is no substitute for a track-type tractor when the going is toughest. A-C's have what it takes.

BOX SCOR
THREE WEEKS' SAL
A-C . . . 33 TRACT
OTHERS . . 4 TRACT
Wisconsin has "gone Al Chalmers" in a big w The same quality featu and advantages that ma A-C Tractors first cho in Wisconsin . . will ena YOU to handle your j in less time . . at lower co

ALLIS-CHALMERS OIL TRACTOR

TRACTOR DIVISION—MILWAUKEE, U. S. A.

EALLIS-CHALMERS



24 HOURS A DAY

All credit to the heroic efforts of Wisconsin public officials and workers. Crews battled the shifting drifts 24 hours a day . . . in bitter sub-zero cold . . . keeping highways open for the public.

BRANCH HOUSE AND DEALER SERVICE

Not only a widespread dealer organization, but FACTORY BRANCHES in every territory—ready to provide service, if needed, at all times.

SHOTS from the Firing Line

"The Voice of the American Highway Industry and Profession"

ANSWERING a widespread demand for a declaration of policy for guidance of the highway industry and officials interested in the advancement of the American highway system, Charles M. Upham, Engineer-Director of the American Road Builders' Association, asked fifty leaders of the various branches of the highway industry to meet preliminary to the opening of the Cleveland Convention. At this meeting a "platform drafting committee" of nine members was appointed to draw up the "Platform for American Highway Development."

The result of the efforts of this committee are found in a ten-point platform, a brief summary of which appears elsewhere on this page. This platform was recommended by the National Highway Advisory Council, and adopted by the American Road Builders' Association at the Cleveland Convention.

The American highway system is described in the foreword as ". . . the indispensable servant of a wide variety of social and economic activities that touch intimately the lives of all." The committee also points out that approximately one-tenth of the employment and industrial activity of the nation comes as a result of the activity of the highway industry. The committee, tersely comments, at the conclusion of the foreword that, "We know of no other investment of public funds by the American people that ever has paid so richly, both in social and community values and in actual employment and profits in private enterprise. Our highway investments, already made and yet to be made, will continue to pay on a comparable scale if the American people will but understand those facts and adhere to the following policies in their handling of the highway questions now before them."

Platform for American Highway Development

(condensed)

I.

Maintain an adequate highway system depending upon (1) determination of actual traffic requirements by observation and analysis, (2) plan, design, and construction of highways that will be adequate with highest over-all economy and safety, and (3) finance of highway construction on a basis that takes into account the responsibilities of the general community, owners of land served, and operators of motor vehicles.

II.

Protect highway funds for exclusively highway purposes, particularly fees, taxes, and other revenues collected from the highway user. Calling such form of tax diversion "class taxation," amendments of state constitutions are recommended to prohibit such misrepresentation of motor revenues.

III.

Continue the established Federal Aid Program.

IV.

Gradually taper off emergency federal highway appropriations until such time as the various states and other political sub-divisions are in financial position to resume their normal responsibilities.

V.

Place administration of all Federal appropriations for public highways by the Bureau of Public Roads.

VI.

Immediate study to determine a sound and rational basis of development of secondary highways and through streets, including those under County and Municipal jurisdiction.

VII.

Entrust the construction and maintenance of all highways to competent and experienced highway officials, engineers, and workers only. Use the contract system for new construction and reconstruction.

VIII.

Remove highway improvements as quickly as possible from the status of unemployment relief measures and re-establish as a continuing, productive, public investment.

IX.

Increase highway safety. Reconstruct existing highways looking toward wider roadways, divided traffic lanes, easier curves, less hazardous grades, higher visibility, adequate marking, elimination of grade crossings, and control of roadside uses.

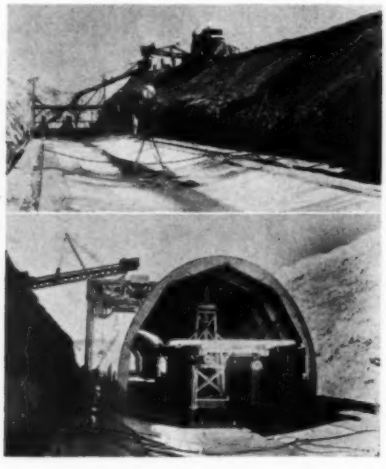
X.

Ascribe full value to the industrial labor involved in the production, processing, and distribution of materials, machinery, and equipment, as well as to the field labor employed in construction, in considering the effect of highway expenditures on the employment of labor.

Flood Control to Senate in March

THE OVERTON BILL embodying the Markham plan of flood control on the lower Mississippi and tributaries is expected by Manager Beneke of the Mississippi Valley Flood Control A.G.C.,

● *Along the Colorado River Aqueduct. Left: Dravo Contracting Company holes through on a 2½-mile section of the Valverde tunnel. Center top: Pouring concrete for the invert on Thompson-Starrett Company's conduit section. Center bottom: Placing steel forms for the arch on the same section. Right: A finished section of concrete-line canal built by Wood and Bevanda.*



an ATLAS DIESEL *handled the* AGGREGATE

In the piers and anchorage of the Golden Gate Bridge, greatest of all the world's suspension bridges, there are more than 260,000 cubic yards of concrete. That is sufficient concrete to build a solid shaft 25 feet square and two miles high.

Practically all of the aggregate for this huge amount of concrete was furnished by Pacific Coast Aggregates, Inc., which operates 25 modern sand and gravel plants in Northern California. The aggregate for the Golden Gate Bridge came from the Livermore Valley and the picture below shows how an ATLAS DIESEL powered Brownhoist locomotive crane handled the aggregate.

The Livermore plant has a capacity of 350 tons per hour and the ATLAS DIESEL powered Brownhoist is used for switching, loading and unloading railway cars. At their Niles plant, a few miles away, is another ATLAS DIESEL powered Brownhoist, working in conjunction with a similar unit powered by steam.

The ATLAS DIESEL powered Brownhoist has an average fuel cost of $25.00 per month or about a dollar a day. The steam rig shows a fuel cost of $5.50 per day. In addition to the high fuel cost there is an additional waste of time and fuel steaming up in the morning, and constant interruptions in having to shut down for water.

Comparative figures like these have influenced the construction industry to "go Diesel" and that means ATLAS DIESEL. There are today more ATLAS DIESELS powering shovels, excavators and draglines and locomotive cranes than the engines of all other manufacturers combined. The construction industry "dishes out" tough jobs—and Atlas Diesels can "take it".

ATLAS IMPERIAL DIESEL ENGINE CO.

OAKLAND, CALIFORNIA ● MATTOON, ILLINOIS

ATLAS IMPERIAL

For your convenience in writing to Atlas Imperial Diesel Engine Co., you will find a card bound in this issue.

to be favorably reported out of the Senate Commerce Committee early in March.

It seems likely that an attempt will be made to hang onto the bill a long string of amendments covering groups of reservoirs in the valleys of the Arkansas, White, Ohio, Obion, and Wabash Rivers. These are not included in the plan, General Markham confining his recommendations to the lower river and tributaries and considering reservoirs in the outlying areas accessories which should be considered later after the more essential protective work has been provided.

Meanwhile, working more strongly than the various groups which are attempting to assist the bill through the Congressional mill, nature seems to be well on the way in preparing another dangerous Mississippi flood. The entire upper watershed is covered deep with ice and snow; the ground is frozen deep. If March proves a wet month, the U. S. Weather Bureau believes a record flood such as we have not had since 1927, is likely to measure again the defenses we have built against the power of Old Man River.

New Acting Commissioner of Reclamation

SECRETARY of Interior Harold L. Ickes has appointed John C. Page, Chief of the Engineering Division of the Bureau of Reclamation, Acting Commissioner of Reclamation.

Raymond F. Walter, who served until the appointment of Mr. Page, has returned to Denver again to take personal charge of the field offices of the Bureau.

Mr. Page first entered the Reclamation service October 1, 1909 as a topographer in the location of canals in Colorado, then left it briefly to serve as city engineer for Grand Junction, Colorado. On July 1, 1911, he re-entered the employ of the Bureau and assisted in the construction of the Grand Valley Project. Since that time he has been in the Bureau continuously.

House Holds Up Appropriation on Five Projects, Including Passamaquoddy and Florida Canal

THE HOUSE refused to appropriate $29,000,000 recommended by the Administration to carry on construction of the Passamaquoddy tidal power project, the Florida canal, the Sardis Reservoir in Mississippi, the Conchas Dam in New Mexico and the Bluestone reservoir in West Virginia because those five projects have not been authorized by Congress.

The adverse committee report, sustained by the House, reads:

"The committee is in thorough accord with what seems to be the future policy completely to finance such projects out of specific regular annual appropriations, but only after such projects have been authorized by law. Included in the estimate of $29,000,000 are five projects which have not been authorized by law. Two of the projects (Sardis Reservoir and Bluestone Reservoir), it is true, have been favorably recommended, but that does not mean necessarily that they will be authorized. For these five unauthorized projects there had been allotted as of January 17, 1936, $14,700,000 of the appropriation 'Emergency relief, 1935-1937.' It is estimated that they will cost to complete, including such sum of $14,700,000 already made available, $218,874,000.

"The Budget proposes an appropriation of $29,000,000 to carry the work forward. If for no other reason, the committee feels that the total ultimate cost involved is too great for it to recommend an appropriation for further prosecution of work upon such projects until they have run the usual gauntlet of scrutiny by the Corps of Engineers, the legislative committees having jurisdiction over such matters, and the legislative bodies themselves. Consequently, the appropriation proposed of $167,677,899 for rivers and harbors has been reduced by $29,000,000, or to $138,677,899. Even with such reduction, the amount for new work, including flood control will be approximately $45,000,000 more than was made available prior to the employment of relief appropriations.

"The committee's action does not mean in any sense that these five unauthorized projects are to be abandoned. Two of them, as has been previously stated, already have been favorably recommended by the Chief of Engineers. It is entirely possible that all will be. There would seem to be ample time for the appropriate legislative committees to study the projects in order that the House may at least have the views of such committees before being called upon for the first time to appropriate money for carrying them forward, which, of course, could be done later in the session in a deficiency measure."

● *Over 12,000,000 yards of excavation were moved by a fleet of heavy-duty shovels in preparation for placing the concrete foundation of Grand Coulee Dam. Shown here, one of Mason-Walsh-Atkinson-Kier Company's 120-B Bucyrus-Erie electric shovels loads to two 13-yard Athey dump wagons.*

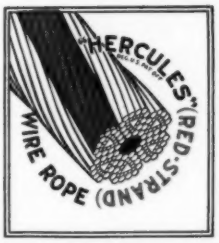
Proposed River and Harbor Schedule

RIVER AND HARBOR construction proposed by the Corps of Engineers for the new fiscal year, as reported to the House Appropriations Committee, follows: Cape Cod Canal, $4,000,000; Boston Harbor, $1,080,000; Hudson River Channel, $376,000; New York and New Jersey Channels, $2,500,000; Inland waterway from Delaware River to Chesapeake Bay, $5,493,000; Great Lakes to Hudson River waterway, $5,000,000; Caloosahatchee River and Okeechobee drainage areas, $1,862,000; Mississippi River between the Missouri River and Minneapolis, $25,000,000; Illinois River, $7,018,000; Missouri River from Kansas City to Sioux City, $7,000,000; Tygart River Reservoir, $3,700,000; Kanawha River, $1,625,000; Ohio River for lock and dam construction, $800,000; Columbia River at Booneville, $2,425,000; Grays Harbor and Chehalis River, $1,000,000; Brunswick Harbor $173,000; St. Johns River from Jacksonville to ocean, $674,000; Ft. Pierce inlet, $210,000; Lake Worth inlet, $450,000; Mississippi River between the Ohio and Missouri Rivers, $1,000,000; Ohio River for open channel work, $345,000; Missouri River from mouth to Kansas City, $1,000,000; Detroit River, $130,000; St. Mary's River, $175,500; Calumet Harbor and River, $600,000; Indiana Harbor, $94,000; Los Angeles and Long Beach Harbors, $1,560,000; New York Harbor, $1,420,000; Harlem River, $700,000; Winyah Bay, $325,000; Savannah Harbor, $945,000; Galveston Harbor, $234,000; Straights of Mackinac, $50,000; Grays Reef Passage, $132,400.

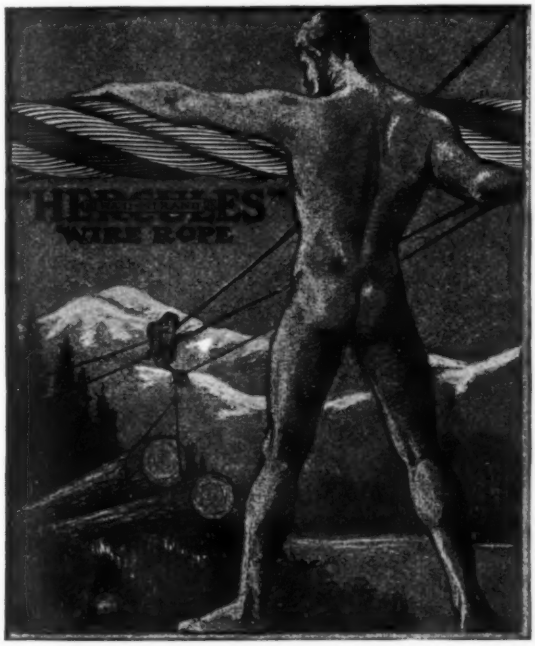
Early Start Promised on Fresno Dam

SECRETARY of the Interior Harold L. Ickes approved on February 25th an arrangement under which preparations will be started immediately by the Bureau of Reclamation for construction of the Fresno Dam on the Milk River project in Montana.

A Public Works Administration allotment of $2,000,000 is available for

Made of Acid 

Open-Hearth Steel



IT'S MADE OF THE "RIGHT STUFF"

Like men, wire rope gets tired too. And like some men, some wire rope wears out before others.

A man who is as strong and active at the finish of a hard steady grind, as he was when it started we say is made of the "RIGHT STUFF." And that's why "HERCULES" (Red-Strand) Wire Rope is able to "take it" on those tough jobs . . . it too, is made of the "RIGHT STUFF."

"HERCULES" (Red-Strand) Wire Rope is made of acid open-hearth steel rope wire, because this wire is higher in fatigue-resisting properties, thereby giving longer life on the job. While it costs more to produce acid open-hearth steel wire, it makes a wire rope that is more uniform, more dependable and longer lasting.

When you specify "HERCULES" (Red-Strand) Wire Rope, you are buying a thoroughly proved and time-tried product, that's made of the "RIGHT STUFF," by a company that has been making rope for 79 years.

Made only by

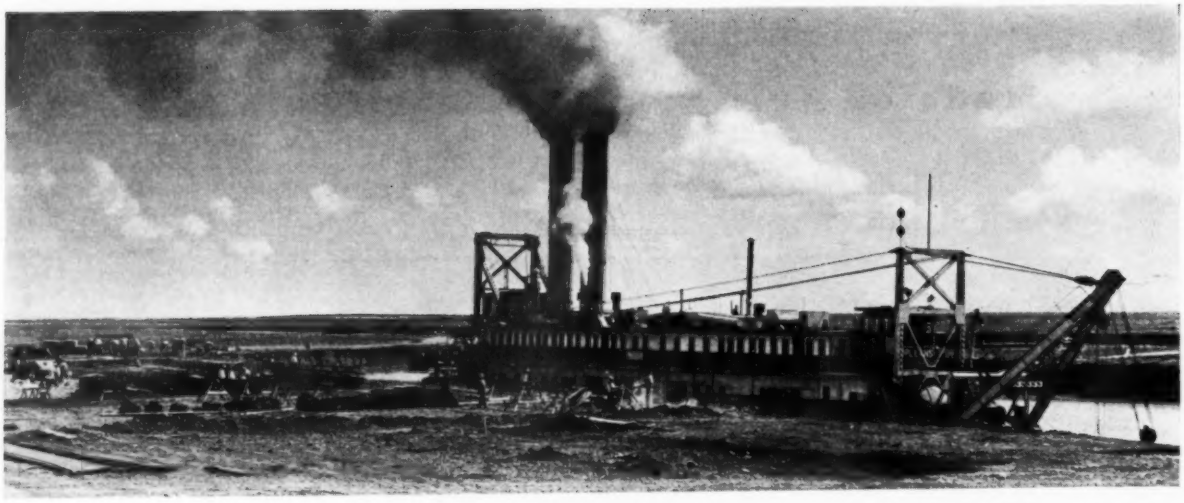
A. LESCHEN & SONS ROPE CO.

Established 1857

5909 Kennerly Avenue, St. Louis, Mo.

New York	90 West Street	Denver	1554 Wazee Street
Chicago	810 W. Washington Blvd.	San Francisco	520 Fourth Street

For your convenience in writing to A. Leschen & Sons Rope Co., you will find a card bound in this issue.



construction of this dam, which will develop the water storage possibilities of the Chain-of-Lakes region. Construction will start as soon as formal repayment contracts have been signed by water users requiring 80 percent of the water to be stored. The Bureau will retain title to 20 percent of the water for sale under contract in the future to areas in need of a supplemental supply.

R. F. Walter, Acting Commissioner of Reclamation, has notified the Denver engineering office of the Bureau to proceed with preparation of specifications for Fresno Dam so that its construction may be advertised. He also notified W. J. Burke, the Bureau's district counsel at Billings, Montana, to draw up the formal contracts for execution with the Fort Belknap, Malta and Glasgow Irrigation Districts.

Brown and Root to Clear Hamilton Reservoir

THE CONTRACT for clearing the Hamilton reservoir on the Colorado River Project of Texas has been awarded to Brown and Root, Inc., of Austin, Texas, on its bid of $323,350, lowest of eleven submitted to the Bureau of Reclamation.

The successful bidder was lowest on each of two schedules, one covering 6,100 acres and the other 9,700 acres, on which the bid was $134,200 and $189,150 respectively.

The Colorado River Project of Texas is being built by the Bureau of Reclamation in cooperation with the Lower Colorado River Authority of Texas. The Authority received a $15,000,000 loan and grant from work-relief funds and the Bureau $5,000,000 from the same source as the government's contribution for flood control benefits, for construction of the project.

The contract to clear the Hamilton reservoir is the first to be let since construction began. The Bureau of Reclamation is completing Hamilton Dam, an incomplete structure taken over as a part of the project, with government forces.

Plans and specifications are being prepared for advertisement of other work on the project in the near future.

Fifteen Million for Flood Control

THE WAR DEPARTMENT appropriation bill, passed by the House of Representatives February 14, carries $15,000,000 for Mississippi River flood control; $38,677,899 for river and harbor maintenance, and $100,000,000 for new and old river and harbor construction, all to be expended within the fiscal year ending June 30, 1937.

This is the smallest Mississippi River flood control appropriation since 1927, but is ample to finance dredging, bank protection and the small amount of unfinished levee work in the valley.

● *From the anthracite fields comes this snapshot showing A. E. Dick Contracting Company's four-yard electric shovel loading rock and dirt in a strip mine. The Mack truck is equipped with an Easton Car & Construction Company's heavy-duty body which has a capacity of approximately 16 yards when heaped.*

● *Bringing a city to the Sea—Brownsville, Texas, now 15 miles from the Gulf of Mexico, is being transferred into a seaport with a PWA allotment of $2,694,000. The Corps of Engineers are cutting a 100-foot channel from the Gulf to the city, digging a 1,000-foot turning basin, and constructing wharves and sheds, in the hope of lowering freight rates on oil and other Texas products.*

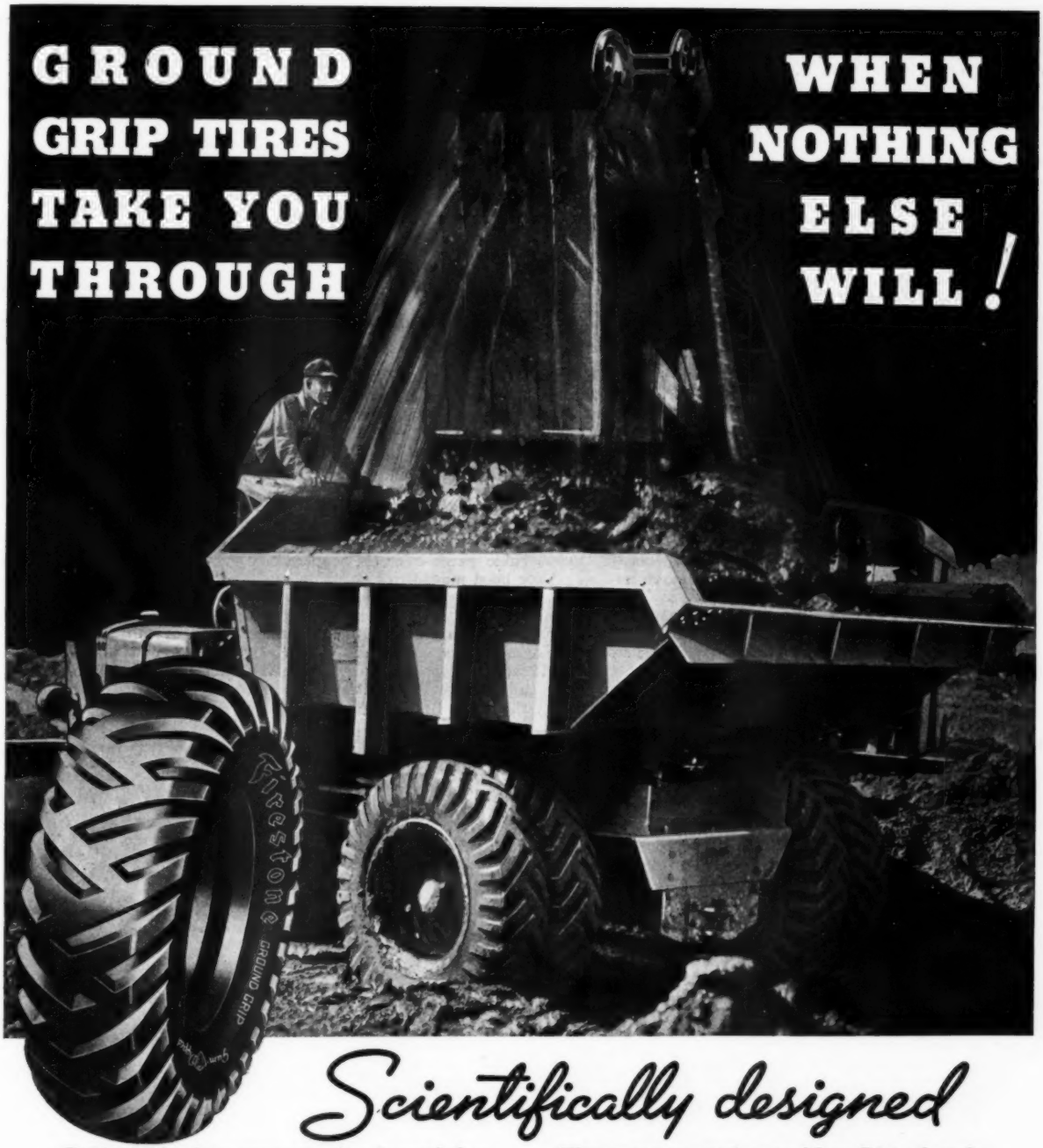
Morgan Low on Levee

EDWARD E. MORGAN COMPANY, INC. of Jackson, Mississippi, was low by $20.00 on the combination for 600,000 yards of levee rebuilding and enlargement on the Illinois River in the Lost Creek Drainage and Levee District and Sub-district I of the Hagar Slough Special Drainage District. The Morgan bid was $68,880, with Perry McGlone of Kansas City just $20.00 away with a bid of $69,000. The Morgan bid was 11.48 cents per cubic yard, the government estimate being 14.9 cents. Bids were opened February 13th at the St. Louis office of the U. S. Engineers.

"Fifty-four Below" at Fort Peck

THE UNPRECEDENTED cold wave which swept over Fort Peck as well as the rest of the country recently, brought all but necessary outside construction activities to a standstill. An all-time record for low temperature at the Fort Peck weather station was recorded at 8:00 A. M., February 15, at minus 54 degrees. At the same time, Glasgow recorded its all-time official low with a temperature of minus 59. The difference is accounted for by the difference in altitude. Unofficial readings in the Missouri River bottom near the dam showed minus 61 degrees.

Under such conditions outside construction activities, of course, are practically impossible. But it is interesting to note that machines quit before the men. Workmen reported for duty as usual, but it was found that the extreme



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cold made it impossible to operate internal combustion engines. Therefore, practically, the only construction work carried on was in the tunnels, and even there the work went forward under difficulties. The difficulty arose chiefly from the low temperatures of the steel and other materials taken from outside storage into the tunnels. The materials were so cold that the workmen were unable to handle them until they had warmed up during several hours stay under ground.

Work in the control shafts of No. 1 tunnel was suspended after 10 feet of excavation had been made in the 60-foot circular main shaft and after 12 feet had been dug in the rectangular emergency shaft. It was necessary to suspend work in these shafts because it was impossible to carry on grouting operations. In the meantime, work has been started in the two similar shafts of tunnel No. 2.

Enlargement operations proceeded much as usual. The new operation of welding all joints of the steel ringbeams and purlins which are used to brace the rough rock excavations has been started in tunnels 2, 3 and 4. This is being done so that these steel members will increase the structural strength of the concrete linings. The beams in No. 1 tunnel downstream from the shafts will not be welded, inasmuch as this section will probably receive a water-tight steel plate lining in addition to the concrete.

A. G. C. Contest Awards

FORCUM-JONES CO., Dyersburg, Tenn., has been awarded the Goble Cup, presented annually by the Associated General Contractors of America. This cup goes to the company having the best safety record during the yearly contest.

Other awards were: The Austin Cup—for the chapter having the best record—to Detroit; the Horst Cup—awarded for the best individual record in the winning chapter—presented to Cooper-Little Company, Detroit.

Grand Coulee Seven Months Ahead of Schedule

DESPITE ZERO TEMPERATURES and blizzards, progress on construction of Grand Coulee Dam, the giant Government irrigation and hydroelectric project on the Columbia River in Washington, is more than seven months ahead of schedule, the Bureau of Reclamation's February report to the Secretary of the Interior Harold L. Ickes revealed.

Over 18,250,000 cubic yards of rock, earth and clay have been moved to expose foundation rock on which 86,000 cubic yards of concrete has been poured. The stupendous construction job is fulfilling its reemployment function with 4,500 men called back to jobs on the construction site and the great project is driving on so that the Bureau of Reclamation, Department of the Interior, hopes that on Grand Coulee it may equal or surpass its record on Boulder Dam, also built by the Bureau of Reclamation, which now stands virtually complete, 26 months ahead of engineering schedule.

The Grand Coulee contract is 42.2 percent complete and only a little more than 30 per cent of the time allowed has elapsed.

"Very cold weather prevailed throughout February," Frank A. Banks, construction engineer, reported, "and concreting work was radically curtailed."

However, the excavations on both the east and west sides of the river were pushed to virtual completion. A total of 17,600,000 cubic yards of earth and clay and 632,000 cubic yards of rock have been removed to date in exposing the foundation rock. The gigantic belt conveyor system constructed by the contractor to replace trucks in removing the excavated material, shut down this month when the excavation work slacked off to a point where it was unnecessary to operate it continuously. It had operated 13½ months without interruption and had carried nearly 10,000,000 cubic yards of earth to Rattlesnake Canyon, where it was dumped one and one-quarter miles from the damsite and at an elevation of more than 500 feet above the dam.

When the cold snap slowed up the concreting work, it was just reaching

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normal speed with 4,500 men employed. A total of 86,000 cubic yards of concrete has been poured, with a large share of the west side bedrock covered.

The materials have arrived and the footings have been prepared for the east side concrete mixing plant, which, like the one on the west side, will have a capacity of 6,000 yards of concrete a day.

The flow of the Columbia River has been low and pools are frozen over. Much late loose snow covers the watershed, snow which may thaw rapidly. Every precaution is being taken to guard against damage from a rapid rise in the river and no trouble is anticipated.

Meanwhile the Columbia Basin Project surveys, for which a work-relief allotment of $250,000 was made, are underway on the irrigable lands of the project which the dam ultimately will serve.

Negotiations Under Way on Alaskan Highway

PROGRESS is being made on the proposed Alaskan Highway in line with the authorization of the last Congress to carry out negotiations with Canada for which $100,000 was appropriated. Of the proposed 2200 miles from Vancouver to Fairbanks, about 1,021 miles has already been constructed as part of local road systems. About 880 miles through British Columbia is completed and ready for use. 480 miles is needed in the Yukon where only 50 miles is complete and in Alaska 183 miles must be added to the 91 miles now ready.

The road as contemplated will consist of a 16-foot gravel surface on a 24-foot grade. Required improvements to meet this standard in British Columbia are estimated to require $7,310,000, the sections through the Yukon will cost some $4,680,000, and in Alaska $1,970,000 will have to be spent.

Five Billion Dollars Collected in Gas Taxes During 17 Years

MOTORISTS of the United States have paid more than $5,318,615,856 in state and federal gasoline taxes since taxation of motor fuel to finance highways was inaugurated by Oregon on February 25, 1919, according to Baird H. Markham, Director of the American Petroleum Industries Committee.

Mr. Markham estimated at $4,732,278,290 the total of gasoline taxes collected from motorists by the states in the period 1919 through 1935. Revenues from the duplicating federal gasoline tax were reported as totalling $586,337,566 in the period 1932 through 1935. Unreported revenue running into millions of dollars also has been paid in additional county and municipal levies, he said, explaining that in some sections of the country four different taxes are paid on every gallon of motor fuel, the total tax sometimes running as high as 12 cents per gallon and exceeding the price of the commodity itself.

State gasoline tax collections for 1935 were estimated at $636,160,000 a new record, and about $70,000,000 above the 1934 income, $565,027,000. Federal gas-

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oline taxes cost the taxpayers an additional $172,262,481, or more than $2,000,000 above 1934 revenue, $170,109,270.

Taxpayers of California, Ohio, Pennsylvania, and New York were reported as having paid more than one-quarter of all gasoline tax revenues collected by the states since 1919, as well as the larger share of federal gasoline taxes collected since 1932. Contributions from California's taxpayers to that state were reported as totalling $360,178,538 since 1923. Ohio motorists are estimated to have paid $322,077,448 since 1925. Pennsylvania motorists have paid $315,922,847 since 1921. Motorists of New York, the largest gasoline-consuming state, have paid $264,820,907 since 1929.

Government Takes Over Boulder Dam

BOULDER DAM and power house were accepted on behalf of the United States from the contractor on March 1, thus terminating the contract and marking the end of actual construction of the project in 11 days less than five years—two years, one month and 28 days ahead of schedule.

More than a year prior to its becoming Government property, Boulder Dam was put to work at its task of controlling the floods and conserving the waters of the Colorado River. The gates of the diversion tunnels were closed February 1, 1935 and a dangerous flood of a few months later was caught and stored.

While the completion of the project was being pushed, Mead Lake, which is formed by the dam, filled to one-seventh of its capacity and grew to be the largest existing artificial body of water. In addition to catching a threatening flood, Boulder Dam prevented a drought in the irrigated valleys along the lower Colorado River, where crop losses of $10,000,000 in 1934 are reported, by making it possible to release from storage a larger volume of water than the river was carrying during the summer and fall of 1935.

Meantime preparations are being made to place the first battery of gigantic 82,500-kilovolt ampere generators in operation in May or June. Four of these are being installed at this time. In all the power house will contain 15 generators of this size and two of 40,000 kv.a. capacity. The power house will not be fully equipped for several years.

In construction of Boulder Dam and power house, the Bureau of Reclamation estimated that a total of 604,800 man-months was provided of all classes of employment.

The Reclamation Bureau will take over the plant and equipment of the contractor for use without charge until October 1 in the installation of power house equipment and in putting certain finishing touches on the structures.

Under the contract entered by the Bureau with Six Companies, Inc., on March 11, 1931, the contractor's gross earnings will amount to approximately $54,700,000. With deductions made for various services, such as provision of electric power and rental at Boulder City, the actual cash payment to the contractor will approximate $51,950,000.

After the contract was let, a change was made in the design of the power house to increase its size. This increased the cost of the power house by more than two million dollars over the

● *Shown here, workmen are constructing the coagulation chamber bed for Milwaukee's $4,100,000 water purification plant, a PWA project. The concrete is pumped through a long pipeline by a Rex Pumpcrete. The new purification plant will provide Milwaukee citizens with fresh water without the disagreeable odor and taste accompanying chlorinated water.*

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estimate. This was the most important of several alterations in plans and design. The penstock tunnels, however, were increased from 30 feet in diameter to a size which would permit the installation in them of steel pipe of 30-foot diameter. This increased the cost of these tunnels by about one million dollars over the estimate.

Up to January 1, 1936, Six Companies had excavated 5,965,972 cubic yards of all classes of materials on which it earned $27,433,627. It had poured 4,364,903 cubic yards of concrete in the dam and power house, and thus earned $19,305,198. This amount of concrete would build a standard highway across the continent. In almost 100 dams it had built up to 1933 the Bureau of Reclamation had poured a total of 3,690,000 cubic yards of concrete. These figures were increased by work done in January and February, but not appreciably.

The amount of concrete actually poured in Boulder Dam itself, without considering the appurtenant works such as spillways, intake towers and power house, was 3,240,871 cubic yards, for which the contractor was paid $8,750,351.70. The most costly single item in the construction program was the drilling of the four 50-foot diameter diversion tunnels at $12,914,874.

These tunnels carried the Colorado River around the site of the work until February 1, 1935, when the dam was sufficiently near completion to permit the start of storage of water. Two tunnels were drilled on either side of the river, each being about 4,000 feet in length. They will be used permanently for the greater part of their length, the outer two as a part of the spillway system and the inner pair as penstock tunnels.

Only one important item in the Six Companies' contract will not be completed when the contract is terminated. It is the plugging of one of these tunnels. The Bureau found it necessary to delay placement of this plug because of the necessity to by-pass water for irrigation through the tunnel until the power house is placed in operation. The Bureau will place the plug by force account when the time arrives.

● *Bucyrus-Erie 32-B Diesel shovel is erected as part of the complete road building equipment ordered by the government of El Salvador. In the background is the residence of the President of the Republic.*

"Shovel-Watching" in Central America

THE ERECTION of a new excavating machine is just as interesting an event in the Central American country of El Salvador as it is anywhere else in the world. At least it appears that this group of El Salvador citizens are finding it highly entertaining to

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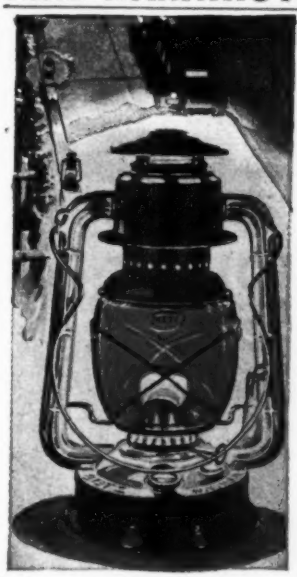

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● *Diesel-powered 2-W Bucyrus-Monighan owned by Burket Construction Company on a narrow cut along the canal loading to a 1½-yard Athey wagon; Euclid Trac-Truk next up.*

watch mechanics assemble a new Bucyrus-Erie 32-BE power shovel. Even the President of the Republic, from his office on the second floor of the executive mansion shown in the background, evinced great interest in the work. Several times during the progress of assembly, he sent an aide out to ask the workmen the purpose of various parts as they were installed.

This new Bucyrus-Erie 1¼-yard excavator is part of the extensive road building program planned for El Salvador in 1936, and is claimed to be especially suited to highway building problems in this progressive Central American country. A 91 H.P. Caterpillar Diesel engine provides excellent "lugging" ability and operates at extremely low fuel cost. Long crawler mountings with wide treads make it easy to use the machine over all types of surfaces.

In the foreground of the illustration, a Caterpillar Diesel 75 tractor, equipped with a Williamette winch, furnishes power for lifting the heavy shovel parts. Beyond is one of the four Caterpillar Diesel 50 tractors which are also a part of the new construction equipment.

The purchase of the new excavator and the other new road building machinery was arranged by Benjamin E. Sol M, progressive San Salvador dealer.

Ocean Going Traffic for Delaware Canal

WITH THE AID of federal money, the old Chesapeake and Delaware Canal is being deepened and widened to permit the passage of ocean going vessels. The original canal, 10 foot deep and with locks, was built in 1825. While it has been in more or less continuous operation since that time it was limited to boats of shallow draft and small privately owned pleasure boats.

In 1919 the Federal Government purchased the canal from its owners and dredged it to a depth of 12 feet with a width of 90 feet. Under the direction of the War Department this old artery is to be modernized into an important sea avenue 250 feet wide and 27 feet deep. The length, 14 miles, and the route between the terminal cities, Elk River and Delaware City, will remain unchanged except for a few curves which will be eliminated.

It is estimated that the cost of the completed project will be approximately $18,000,000. The Federal Government has already made an initial allotment of $5,107,000.

Contracts totaling 4,500,000 yards of excavation were let in eight sections to three contractors: Edward H. Company Philadelphia, two sections; and Richards-Kelly Construction Com-Ellis, Inc., Westville, New Jersey, pany, Philadelphia, one section. Of the five sections; Burket Construction total excavation now under contract, 3,000,000 yards will be excavated in one four-mile stretch of the canal.

The work will be completed in one year. When finished, passenger, freight, and naval vessels will have only a 94-mile trip between Philadelphia and Baltimore. At present, a 380,-mile voyage, almost one-half of it in the open sea, is necessary for major ship travel between these two cities. The new waterway will link Philadelphia's League Island and Norfolk navy yards as the only inland water route between these important centers. The canal will also be a link in the Inland Coastal Waterway which extends, with a few gaps, from New York to Texas.

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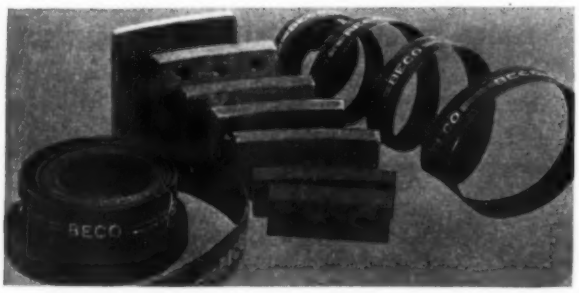

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Old Times and Old Timers

(*Continued from Page 137*)

Islands in the Caribbean Sea brought us a number of interesting replies among which is this one from Old Timer W. G. Russell, of La Vega, Dominican Republic. He writes as follows:

"I have enjoyed Excavating Engineer very much. I find it very interesting, for time and time again I see the names of some old friends of mine whom I thought had crossed the Great Divide by this time, and no doubt they have thought the same of me.

"I started in the steam shovel game quite a while back when the Bucyrus machine was known as the Thompson shovel, crane-type. The first machine was for Dick & Martz, Audenried, Pennsylvania. A man by the name of Dillie Coalman came out with it from the Bucyrus factory. Shortly afterwards the same firm bought a second shovel which was shipped to Lumber Yard, Pennsylvania. John Michles came with that one. He was killed on that job by a dynamite explosion.

"Since that time the firm has acquired a number of Bucyrus shovels, large and small, and at the present time is known as A. E. Dick & Company of Hazleton, Pennsylvania.

"In 1890, Morea Coal Company got a Thompson machine at Morea, Pennsylvania. John Wilson came along with that one. That is where I moved up to craneman. During the World's Fair (1893) I drifted out to Chicago and stayed there quite a while, working on the drainage canal from start to finish. Then I worked for C. C. Gilman & Company while they were double tracking the B. & O. R. R. from Garret, Indiana to South Chicago. Finally I drifted to the Panama Canal job and helped to start and finish it. Came over here (Dominican Republic) in 1917 with C. J. Alberts on a highway job, and here I am.

"I cannot complain, however since 1931 things have been slow in this neck of the woods, and up to the present time the New Deal has not reached this place.

"Do you happen to know what has become of Charles J. Reese who was with the Atlantic Equipment Company at the time the Bucyrus Company took it over? Also Burt Gabriel? The last I saw him he was on his way to Cuba with an Atlantic type shovel.

"Thanking you for your letter bringing me back to earth. I am fine as far as health goes which I believe is the most important. Remember me to any of the old gang of 1890 to 1900 that may be around there.

"Thank you for the copies of Excavating Engineer which I have been receiving in the past, and believe me I enjoy every page of them and particularly all the new things that come out."

Thanks, Old Timer Russell, for your interesting letter about the really old "Old Times."

Copies of "Steam Shovel News" Wanted

CAN ANY "Old Timer" furnish or let us know where we may obtain copies of "Steam Shovel News?" This publication, the predecessor to "Excavating Engineer" was published from December 1904 to September 1912.

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¾ CU. YD. DIPPER—20'6" BOOM, 17' DIPPER HANDLE, high lift shovel equipment suitable for 20-B steam. NEW. SE-32.

⅞ CU. YD. DIPPER—21'9" BOOM and ENGINE — 15' DIPPER HANDLE — High Lift Shovel Equipment. Suitable for 31-B Steam. NEW. SE-13.

1 1 CU. YD. DIPPER—26' boom, 17' handle Shovel equipment—Will fit 30-B. SE-35.

1¼ CU. YD. DIPPER — 25' BOOM — 17' DIPPER HANDLE — Slightly Used Rope Crowd High Lift Shovel Equipment suitable for Model 37-B. New Machine Guarantee. SE-5.

1½ CU. YD. DIPPER—27' BOOM—17' DIPPER HANDLE—High Lift Rope Crowd Shovel Equipment suitable only for Bucyrus-Erie 43-B machines. Rebuilt—New Machine Guarantee. SE-23.

1 1¾ CU. YD. DIPPER, 30' boom, 19' handle, high lift shovel equipment—Will fit 50-B. New. SE-33.

1 1¾ CU. YD. DIPPER, 22' boom, 16' handle, shovel equipment—Will fit 43-B. New. SE-34.

Skimmer Scoop

⅝ CU. YD. DIPPER—20' Boom together with all necessary ropes and material to completely convert Bucyrus-Erie 1020 Shovel, Clamshell or Dragline to Skimmer Scoop Machine. NEW. Shipment 2 to 3 weeks. SS-1.

Dragline Equipment

40' CHANNEL BOOM, FAIRLEAD AND ROPES, but not including bucket. For use on Model D-2—20-B—31-B. Used. DL-3.

BRAND NEW Ropes included with each of above Complete Equipments.

Trench Digging Equipment

1 CU. YD. 42½" WIDE—Solid type Dipper—24' Boom and all auxiliary equipment. Will dig maximum depth 22'. For application to GA-2 or GA-3 Shovel. Rebuilt—New Machine Guarantee. DS-5.

BRAND NEW PAGE, two dippers each ¾ cu. yd., one 38" wide over cutters, the other 49½" wide over cutters. 17'1½" Boom and all necessary auxiliary equipment. Will fit Bucyrus-Erie 1030 or 1035. DS-7.

1-CU. YD. 42½" WIDE SOLID TYPE DIPPER—24' Boom and all auxiliary equipment—will dig maximum depth of 22'—For application to GA-2 or GA-3 Clam Shell or Drag Line. Rebuilt—New Machine Guarantee. DS-8.

BRAND NEW Ropes included with each of above Trench Digging Equipments.

DIPPER HANDLES

1 7'6" 1030 TUNNEL—Complete. New. H-1.
1 7'10½" 20-B TUNNEL (two sticks). New. H-2.
1 9'0" 31-B TUNNEL (two sticks). New. H-3.
3 9'0" 30-B TUNNEL (two sticks each). New. H-4.
1 9'6" 20-B TUNNEL (two sticks). New. H-5.
1 9'6" 31-B TUNNEL (two sticks). New. H-6.
1 12 0" 18-B—Complete. New. H-7.
1 12'6" D-2, 31-B—Complete. New. H-8.
1 12'6" D-2, 31-B—Complete. New. H-9.
1 13'0" 1020—Complete. New. H-10.
1 15'0" 20-B OIL (two sticks). New. H-12.
3 15'0" E-2 41-B—Complete. New. H-13.
1 15'0" 43-B—Complete. New. H-15.
1 16'0" TYPE "A"—Complete. New. H-16.
2 16'0"—43-B—Complete. New. H-17.
1 17'0"—TYPE "A"—Complete. New. H-18.
1 17'0"—20-B HIGH LIFT—Complete. New. H-19.
1 17'0"—37-B—Complete. Used. H-21.
1 17'0"—50-B OIL (two sticks). New. H-23.
1 19'6"—37-B—Complete. New. H-25.

BOOMS

1—15'0" 1030 CHAIN CROWD SHOVEL BOOM—Used. JA-32
4—18' 20-B STEAM SHOVEL BOOM—New. JA-2.
1—18' 31-B STEAM SHOVEL BOOM—New. JA-3.
1—20'0" 1020 ROPE CROWD SHOVEL BOOM—New. JA-23.
1—20'0" 1020 ROPE CROWD SHOVEL BOOM—New. JA-33.
1—20'0" 1030 CHAIN CROWD SHOVEL BOOM—New. JA-24.
2—20'6" 20-B STEAM SHOVEL BOOM—New. JA-4.
1—21'6" 37-B CHAIN CROWD SHOVEL BOOM—New. JA-26.
1—21'9" 31-B STEAM SHOVEL BOOM—New. JA-5.
2—22'0" 43-B CHAIN CROWD SHOVEL BOOM—Used. JA-27.
3—23' 20-B DIESEL, GAS OR ELECTRIC SHOVEL BOOM—New. JA-7.
1—23'6" 37-B ROPE CROWD SHOVEL BOOM—New. JA-28.
1—24'0" 43-B ROPE CROWD SHOVEL Boom—New. JA-29.
1—24'0" GA-2 DRAG SHOVEL BOOM—New. JA-30.
1—24'0" GA-2 DRAG SHOVEL BOOM—Used. JA-34.
1—24'0" GA-3 DRAG SHOVEL BOOM—New. JA-35.
1—24' GA-2 or GA-3 SHOVEL BOOM—New. JA-8.
2—24' 43-B ROPE CROWD SHOVEL BOOM—New. JA-9.
1—25'0" 37-B ROPE CROWD SHOVEL BOOM—Used. JA-36.
1—25'9" 30-B DIESEL SHOVEL BOOM—New. JA-10.
1—26' 20-B DIESEL SHOVEL BOOM—New. JA-11.
2—26' D-2 SHOVEL BOOM—New. JA-13.
1—26' 50-B STEAM SHOVEL BOOM—New. JA-15.
3—27' 43-B ROPE CROWD SHOVEL BOOM—New. JA-16.
1—27'0" 43-B ROPE CROWD SHOVEL BOOM—New. JA-31.
1—30' 50-B ELECTRIC SHOVEL BOOM—New. JA-17.
3—30' 50-B STEAM SHOVEL BOOM—New. JA-18.
1—40' 20-B, 31-B and D-2 DRAGLINE BOOM—Used. JA-20.

DIPPERS

Small Machines

3 ½ CU. YD.—**Plate Front**—Will fit 1020 Drag Shovel. New. D-45.

2 ⅝ CU. YD.—**Plate Front**—Will fit 20-B. New. D-12.

1 2/3 CU. YD.—**Plate Front**—Will fit 14-B. New. D-13.

2 ¾ CU. YD.—**Rock Type**—Will fit 20-B. New. D-15.

1 ⅞ CU. YD.—**Ins. Tooth**—Will fit 1030. New. D-47.

1 1 CU. YD.—**Ins. Tooth**—Will fit Types B, B-2, B-3, GA-2 and GA-3. New. D-48.

1 1 CU. YD.—**Plate Front**—Will fit 20-B. New. D-42.

1 1 CU. YD.—**Manganese**—Will fit B-2 and GA-2. Good condition. Used. D-40.

1 1 CU. YD.—**Rock Type**—Will fit 1030 Tunnel Shovel. New. D-50.

2 1¼ CU. YD.—**Ins. Tooth**—Will fit 30-B, 42-B, E-2. New. 41-B, D-44.

1 1¼ CU. YD.—**Cast Front**—Will fit 30-B, 42-B, E-2. Used. 41-B, D-43.

1 1¼ CU. YD.—**Rock Type**—Will fit 30-B, 42-B, E-2. Used. 41-B, D-27.

1 1¼ CU. YD. — **Ins. Tooth** — Will fit New. 37-B. D-51.

1 1¼ CU. YD. — **Ins. Tooth** — Will fit Used. 37-B. D-52.

1 1¼ CU. YD. — **Ins. Tooth** — Will fit Used. 37-B. D-38.

1 1½ CU. YD.—**Ins. Tooth**—Will fit 42-B, New. 43-B. D-55.

1 1½ CU. YD.—**Ins. Tooth**—Will fit 43-B. Used. D-39.

3 1¾ CU. YD.—**Ins. Tooth**—Will fit 43-B. New. D-58.

1 ⅝ CU. YD. **ROCK**—Will fit 20-B. New. D-64.

1 1 CU. YD. **PLATE FRONT**—Will fit 30-B, 41-B, 42-B, E-2. New. D-65.

1 1 CU. YD. **CAST FRONT**—Will fit 30-B. New. D-66.

Large Machines

1 2 CU. YD.—**Manganese**—Will fit 43-B. New. D-62.

2 3 CU. YD.—2½" Molybdenum cast steel front, two part Van Port reversible teeth—Will fit 100-B, 68-C, 70-C. New. D-2.

1 3½ CU. YD.—2¾" nickel chrome steel front, two part Van Port reversible teeth—Will fit 88-C, 95-C, Class 80 Atlantic. New. D-3.

1 4 CU. YD.—2¾" Molybdenum cast steel front, two part reversible teeth. In good condition. Will fit 100-C, 120-B. Used. D-4.

1 6 CU. YD.—Molybdenum steel front. Annealed cast steel back, two-part Reversible Van Port Teeth.—Will fit 200-B, 225-B and 320-B. New. D-11.

1 8 CU. YD.—Front Molybdenum steel, two part Van Port Reversible teeth. Slightly used but excellent condition.—Will fit 320-B. Used. D-6.

DIPPER TRIPS

1—30-B STEAM DIPPER TRIP—New. DT-1.

1—31-B STEAM DIPPER TRIP—New. DT-2.

8—50-B STEAM DIPPER TRIPS—New. DT-4.

1—D-2 STEAM DIPPER TRIP—Used. DT-5.

BUCKETS

Dragline

3 ¾ CU. YD.—**BECO TYPE "X"**. 2200 lbs. New. DB-21.

3 2 CU. YD.—**PAGE CLASS "C"**. 5630 lbs. New. DB-4.

1 2 CU. YD.—**BECO TYPE "U"**. 3650 lbs. Rebuilt. DB-12.

4 2 CU. YD.—**BECO TYPE "U"**. 3650 lbs. New. DB-30.

1 2 CU. YD.—**BECO TYPE "X"**. 5300 lbs. New. DB-23.

2 2 CU. YD.—**BECO HEAVY DUTY**. 5400 lbs. New. DB-24.

3 2¼ CU. YD.—**BECO TYPE "U"**. 3850 lbs. New. DB-13.

2 2½ CU. YD.—**BECO TYPE "U"**. 4100 lbs. New. DB-14.

1 2½ CU. YD.—**BECO HEAVY DUTY**. 6500 lbs. Rebuilt. DB-9.

1 2½ CU. YD.—**OMAHA—STD.** 5400 lbs. Rebuilt. DB-10.

1 5 CU. YD.—**BECO HEAVY DUTY**. 12700 lbs. New. DB-28.

1 5 CU. YD.—**MONIGHAN HEAVY DUTY**. 12000 lbs. New. DB-16.

1 6 CU. YD.—**MONIGHAN TYPE "W"**. 12500 lbs. New. DB-17.

1 6 CU. YD.—**BECO TYPE "X"**, 14400 lbs. New. DB-29.

1 7 CU. YD.—**MONIGHAN TYPE "W"**. 1370 lbs. New DB-18.

Clamshell

1 2 CU. YD. **TYPE PF WILLIAMS CLAMSHELL BUCKET** without teeth and counterweight. CSB-1.

ELECTRICAL EQUIPMENT

90 H.P. MOTOR — **GENERAL ELECTRIC** — 3 phase, 25 cycle, 550 volt, 1500 RPM. NEW. EE-1.

5 KVA TRANSFORMER—**GENERAL ELECTRIC**—2200-3810 volt primary, 440-220 volt secondary—3 phase, 60 cycle, with cast iron tank and cover, including specially fastened bushings to prevent oil leakage. NEW. EE-4.

125 KW GENERATOR—**WESTINGHOUSE**—250 volts, 500 amperes, Direct current. 440 RPM. Includes two outboard bearings. NEW. EE-5.

TANKS

Water

5—260 GALLON 41⅞"x21"x6'4". No. 14 BW gauge steel plate. T-1.

2—200 GALLON 36½"x20 1/16"x6'3" high. Elliptical—¼" steel plates. T-2.

1—283 GALLON 54⅜"x17⅜"x6'4". ¼" Steel plates. T-3.

Oil

15—60 GALLON 11½"x18"x77" Elliptical Blue annealed copper alloy smooth plate. T-4.

6—25 GALLON 47¼" dia. 14" deep—12 Gauge Std. Blue annealed copper alloy steel. T-5.

1—294 GALLON 48"x21¼"x6'4". ¼" steel plates. T-6.

4—50 GALLON 60" dia. x 12" deep—No. 12 Gauge Std. blue annealed copper alloy. T-7.

Gasoline

1—44 GALLON 18" dia. 43" high—No. 14 Gauge U. S. Std. welded construction. T-8.

5—55 GALLON 30"x18½"x23½" 16 Gauge—U.S.S. Terne metal. T-9.

Air

3—5 CU. FT.—16" dia. x 48" high—225 lb. working pressure A.S.M.E. Std. Tested to 340 lb. cold water test. T-10.

5—6 CU. FT.—16" dia. x 4'4" high—200 lb. working pressure A.S.M.E. Std. Tested to 350 lb. cold water test. T-11.

1—14 CU. FT.—21½" dia. x 77" high—200 lb. working pressure. Will pass inspection in Massachusetts and any Canadian Province. T-12.

2 16 CU. FT—22⅝" dia. 77" high—200 lb. working pressure A.S.M.E. Std. T-13.

ENGINES

Designed especially for application to Excavating or similar Equipment. Can be used for stationary or semi-stationary service.

Diesel

2—140 H.P. NEW, NON-REVERSIBLE ATLAS DIESEL ENGINES—5 cylinder, 9" bore x 10½" stroke, 514 R.P.M., 4 cycle, vertical overhead valves, dust proof, oil tight crank case and forced lubrication. Includes auxiliary air starting equipment. DE-2.

Steam

1 12½"x16" link reversing type for Railroad Shovel. ME-1.

2 4½"x5" reversible—20.8 H.P. at 400 R.P.M. 100 lb. Pressure. ME-2.

1 4¾"x5" reversible—23.2 H.P. at 400 R.P.M. 100 lb. Pressure. ME-3.

1 5"x5" reversible—25.6 H.P. at 400 R.P.M. 100 lb. Pressure. ME-4.

BOILERS

NEW

Will Make That Old Shovel Work Like New.

Can also be used for Miscellaneous Service

Vertical Type

2 46½"x110"—32 H.P.—155 lb. Working Pressure. Special Wood Burning Fire Box. ASME Std. Will fit any B-2 or B-3. B-9.

Locomotive Type

3 44'x17'—75 H.P. 125 lb. Working Pressure. ASME Std. Will fit Model 68-C. B-13.

1 44"x18'—88 H.P.—125 lb. Working Pressure. ASME Std. Will fit Model 70-C. B-14.

1—70"x12'—136 H.P. 175 lb. Working Pressure. ASME and Mass. Std. Will fit 120-B. B-18.

PUMPS

1 NB—3 STAGE CENTRIFUGAL PUMP—2" suction and discharge — bronze impeller and shaft—capacity 100 gallons per minute at 240' head operating at 1720 RPM or 270' head at 1780 RPM. Now equipped for belt drive but can be operated by 15 HP. Electric Motor. ME-6.

AIR COMPRESSORS

1 BRAND NEW WORTHINGTON—METAL-WELD—2-cylinder 7"x6" Vertical 162 cu. ft. piston displacement, Air Compressor. Fitted with Laidlaw feather valves—Lugs on side for mounting on skids or channels—Shaft extended and equipped with semi-flexible coupling to take 2⅝" drive shaft—Force feed lubrication. Automatic control. Includes 1" High capacity centrifugal circulating pump—"V" belt driven—18"x41" Air Receiver, 100 pounds working pressure, A.S.M.E. Standard. Electric or gasoline power required approximately 30 H.P., approximately 1000 R.P.M.—Compressor Speed approximately 550 R.P.M.—Overall dimensions: Height 45"—length 37½"—width 28". AC-3.

2 11"x11"x12" STEAM DRIVEN LOCOMOTIVE TYPE, Westinghouse air compressors with fittings. NEW. AC-1.

1 11"x11"x12" STEAM DRIVEN LOCOMOTIVE TYPE, Westinghouse air compressors with fittings. Used. Make offer. AC-2.

Book Reviews

Highway Safety—A 64-page booklet entitled "I drive safely" has been published by the **International Harvester Company**, 606 South Michigan Avenue, Chicago, Illinois, in the interest of safety on the highways. This booklet was suggested by International Harvester employees whose objective is the elimination of industrial accidents and whose cooperative efforts have brought about an outstanding reduction in such accidents. The booklet is distributed to truck owners and drivers in the hope that it may be helpful in the prevention of highway accidents that are at present taking such a tremendous toll in life and property.

Road Torches—**The McCloskey Torch Company**, 1215 West Bancroft Street, Toledo, Ohio, has issued a 4-page bulletin on bomb shell torches. The torches are available in three sizes and are designed especially for highway and street construction work. The small size torch, No. 3, has been brought out especially for highway truck and bus use, for it serves both as a reliable warning beacon and as a positive truck block.

Arc Welding—A 36-page booklet illustrating and describing all the newest developments in arc welding electrodes and accessories has recently been published by the **Lincoln Electric Company**, Cleveland, Ohio. This booklet is virtually a condensed manual on arc weldings. The complete procedures for each electrode give the polarity, current range, arc volts for each size of every electrode in every welding position.

Heavy-Duty Trucks—"FWD Trucks Dominate in Highway Service" is the title of a sixteen-page illustrated booklet just published by the **Four Wheel Drive Auto Company**, Clintonville, Wisconsin, and Kitchener, Ontario, Canada. Action "shots" and descriptive views plus comprehensive detail are used to show the capacity of the FWD (four-wheel-drive) truck for snow removal, road building, road maintenance and general hauling work. Particular emphasis is placed upon FWD controlled power as a prime factor in making this truck a safe and dependable unit for highway service. A copy may be had free of charge by writing the manufacturer.

Diesel-Electric Generating Sets — Three sizes of Diesel-electric direct-connected generator sets are illustrated and described in a new booklet recently released by **Caterpillar Tractor Company** of Peoria, Illinois. Each unit consists of a Caterpillar Diesel engine equipped with auxiliary fuel pump, close regulation speed governor, and manual control, direct connected to an electric generator and assembled on a cast iron base. The generator sets may be had in either D. C. or A. C. models and are built in 25-, 40-, and 60-KW capacity. Although not illustrated in this booklet, the manufacturer states that two additional series of Diesel-electric generator sets will soon be available—80-KW units powered by the new V-8, 160 hp. D-17000 Diesel engine, and 20-KW generators driven by the 4-cylinder, 44-hp. D-4400 Diesel engine. A copy of the booklet describing these units may be obtained by writing the manufacturer.

INDEX
FOR VOLUME XXIX
January to December, 1935, inclusive
NOW READY
SENT FREE ON REQUEST
EXCAVATING ENGINEER
South Milwaukee, Wisconsin

Rock Drills — **Sullivan Machinery Company**, Claremont, New Hampshire, announces the publication of a new bulletin entitled "Going Places" which describes the new Sullivan L-2 45-lb. rock drill and the advantages to be gained by its use. A copy of the bulletin may be had free of charge by writing the manufacturer.

Material-Handling Equipment — **Jeffrey Manufacturing Company**, Columbus, Ohio, recently published a 400-page catalog, No. 417, on material-handling equipment parts. The items presented include: chains and sprockets; transmission machinery; spiral conveyor, elevator and conveyor parts; along with all other Jeffrey material-handling equipment parts. Also included in the book are specifications and list prices; and a pictorial presentation of material-handling equipment engineered, manufactured and erected by the Jeffrey Company. A copy may be had by writing the manufacturer.

POSITIONS WANTED

Positions wanted advertisements will be run under this heading for 5 cents per word, minimum charge $1.00. Advertisements for help wanted free of charge.

Address all box numbers c/o Excavating Engineer at South Milwaukee, Wisconsin

SUPERINTENDENT OR FOREMAN

Graduate mining engineer having 25 years' experience, greater part of which has been on coal stripping, is looking for position as superintendent or foreman on some kind of dirt moving job. Has been operating metal mines for past two years. Age 48; married. Prefers to stay in Western States but will go anywhere for right opening. Now located in Arizona.
Box 7802.

LARGE MACHINE OPERATOR

Operator with 24 years' experience on all types and makes of machines desires position on large shovel or dragline. Prefers large electric stripper but will consider any permanent connection. Has worked on grading, levee building, quarrying, gravel pit, coal stripping and iron mining. Last job on 750-B coal stripper. Age 45; married. Will go anywhere. Can do own repair work. Best of references furnished. Now located in Indiana.
Box 7803.

OPERATOR

Experienced operator desires shovel or dragline work. Has had fourteen years' experience on shovel, dragline and clamshell in quarry, coal stripping and loading, and contracting. Prefers Bucyrus or Marion—½ to 6 yards—steam, electric or gas. Can do own repair work. Can furnish best of references. Age 39; married. Willing to go anywhere. Now located in Kansas City, Mo.
Box 7702.

DRAGLINE OPERATOR

Dragline operator who has 13 years' experience on levee and ditch work desires position on Bucyrus or Monighan, gas or Diesel power, any size. Operated Diesel machine 7 years; gas-6 years. Willing to go anywhere. Can do own repair work. References furnished. Age 44; married. Now located in Ohio.
Box 7903.

CRANE-SHOVEL-DRAGLINE OPERATOR

Position operating any model Bucyrus-Erie, Northwest, P&H, or Koehring up to 2 yards capacity is desired by man who has had fifteen years' experience on steam and gasoline machines. Can do all repair work and erecting. Excellent references. Now located in Wisconsin. Will go anywhere in U. S.
Box 7801.

MEN WANTED

The Civil Service is holding competitive examinations to March 16th for an Associate Public Health Engineer at $3200 per year and an Assistant Public Health Engineer at $2600 per year. Applicants must be bachelors of engineering from a recognized college or university and must have professional engineering experience in public health work. Application forms can be secured from U. S. Civil Service offices or any first class post office.

EXPERIENCED OPERATOR

Dragline and Shovel operator having 9 years experience desires position operating machine on road building, sewer, canal or drainage excavation. Prefers 3 or 4 yard Diesel dragline, having 5 years experience on Diesel powered machines and 4 years on gas machines. Has operated dragline 5 years, shovel, 2 years, clamshell, 1 year, and crane, 1 year. Age 31; married. Can do own repair work. Best references. Willing to go anywhere. Now located in Illinois.
Box 7902.

SAFETY MAN

Young man, 25 years old, married, desires position in safety work with mine, quarry or contractor. Experienced in creating safety posters, safety education, first aid teaching, etc. Two years college training. Best references as to character and ability. Now located Minnesota.
Box 7901.

OPERATOR

Operator with seven years' experience desires work on any type machine. Has operated draglines 4 years, shovel 2 years and crane-clamshell 1 year. Experienced on steam, electric, gas, Diesel and gas-air machines in sand and gravel pit, stripping, levee building and lock and dam construction. Can furnish excellent references. Willing to go anywhere. Age 28; married. Now located 70 miles southwest Chicago, Illinois.
Box 7701.

EQUIPMENT *You Ought to Know About*

(*Continued from Page 142*)

conjunction with The Lincoln Electric Company, Cleveland, Ohio.

The accompanying illustration shows a truck equipped with one

of the units driving a Lincoln "Shield-Arc" welder.

This power take-off, which makes a truck a power plant as well as a means of transportation, is made in various models to operate as a direct drive or from the side. The unit is adaptable to all makes and models of trucks, according to the announcement, and it does not affect the road speed or power of the truck, since it simply replaces a portion of the truck's drive shaft.

Power supplied by any leading make of 1½-ton truck is sufficient to drive either a 200-ampere or a 300-ampere welding generator. Power take-off can be controlled from the driver's seat by a single lever. While welding, the speed of the truck motor is controlled by a fly-ball type mechanical governor.

Made of chrome-nickel alloy steel, this power take-off weighs 100 pounds fully installed. All bearings are anti-friction ball and roller type. The unit is guaranteed to transmit 120 brake horsepower at 2800 revolutions per minute, 220 foot pounds torque.

International Announces New Two-Speed Axle Models

INTERNATIONAL Harvester Company, Chicago, has announced the addition of three new models to its line of motor trucks each of which features two-speed axle construction providing eight forward and two reverse speeds. With this construction all the advantages offered by both the high-speed and low-speed axle ratios are combined in one unit. The new models are the CS-30, CS-35, and CS-35-T.

In the past it has been necessary for truck owners requiring variable performance ability to choose between a high or low-speed axle ratio. The high-speed axle ratio would allow the truck to be driven on level roads at high speeds with consequent saving in engine wear, and gasoline and oil consumption, due to slower engine speeds. The objection to the high-speed axle ratio was that payload must be sacrificed if hills and rough roads were to be negotiated. If operating conditions necessitated using a low-speed axle ratio, engine wear and gas and oil consumption were increased due to higher engine speeds. Road speeds with the low-speed axle ratio naturally were sacrificed for the necessary power.

With the International two-speed rear axle models, however, the truck owner has both speed and power, combined and available in one unit. The low-gear axle ratio enables heavy loads to be hauled up steep hills and over rough roads, while the high-gear axle ratio allows high speeds on level roads or with light loads. A simple movement of the shifting lever and the driver changes to either low-speed or high-speed operation instantly and silently without stopping the truck. This two-speed rear axle is available in both the 5.14 to 1, 7.15 to 1 and 6.16 to 1, 8.57 to 1 axle ratios.

The Model CS-30 is available in two wheelbases — 133 and 157 inches, while the Model CS-35 is offered in 136, 160, and 175-inch wheelbases. The six-wheeler Model CS-35-T is built in two wheelbases—168 and 180 inches.

Williams 6-Yard Clamshell

A DREDGING COMPANY recently called upon the Wellman Engineering Company, Cleveland, to build a special 6 cubic yard capacity, power-arm type of Williams clamshell dredging bucket to withstand the severe service encountered in under-water excavating in harbor work.

The accompanying illustration shows the completed bucket before shipment was made, and some idea of its enormous size can be realized from the fact that its total height is over 17′ 0″ and its weight, when empty, 30,000 lbs.

This bucket was engineered by Wellman to withstand the unusual strains and stresses to which a bucket of this size might be subjected in the severest dredging operations, and it was found that the most practical way in which the increased ruggedness required could be provided was in the adoption of a design using all-welded parts in place of the customary castings, utilizing at the same time, the most modern high strength, low carbon, alloy steels, available, having the desired physical values which lend themselves to perfect welding fabrication. This construction permitted of a lessening and a better distribution of the weight, with added strength where most needed.

FOR SALE

RATES

60c per line—minimum charge $2.40. Repeat insertions with no change in copy—three insertions for the price of two.
Display advertising in this section at published display advertising rates.
Estimate 41 characters per line, counting all spaces and punctuation as one character each. Allow ten characters for box number for blind advertisements. If address given, counts same as advertising copy.
Rates are net (no commission, no discount) and payable in advance of publication. Send your remittance with insertion order and copy.

Address all box numbers c/o Excavating Engineer at South Milwaukee, Wisconsin

Small Shovels
Under 2 Yards

⅜-YARD

BYERS BEARCAT JR.—⅜ CUBIC YARD GASOLINE SHOVEL. BUDA HIVELO ENGINE. Approximately one year old. Excellent condition. Favorable price. Located Minnesota. Box 791-SS.

BYERS-BEARCAT — Combination Shovel—Pull Shovel and Lifting Crane; Half swing. Gasoline power. Excellent condition. Located Detroit, Michigan. Box 690-SS.

INSLEY SKIMMER SCOOP—48" BUCKET. Bargain price. Located vicinity Boston. Box 792-SS.

INSLEY ⅜ YARD GASOLINE COMBINATION SHOVEL AND BACK HOE. Half swing. Steel Cab. Good condition. Located Central Pennsylvania. Box 735-SS.

UNIVERSAL-UNIT ¾-swing combination ⅜ cu. yd. gasoline shovel and 30-foot boom dragline, including ⅜ cu. yd. dragline bucket. Working every day. Good condition. Located Grand Haven, Michigan. Box 769-SS.

UNIVERSAL—MODEL B—GASOLINE SHOVEL. Good operating condition. Located Indiana. Will deliver any point in state. Box 781-SS.

½-YARD

BROWNHOIST MODEL NO. 2 ½ cu. yd. roto-crowd gasoline shovel or clamshell. Waukesha four cylinder engine in good operating condition. Bargain price. Located near Peoria, Illinois. Box 689-SS.

UNIVERSAL—MODEL NO. 35—½ cu. yd. shovel and 28' boom clamshell including ½ cu. yd. Owens clamshell bucket. Powered by Waukesha four cylinder 4½" x 6¼" gasoline engine. Engine completely overhauled this year. Entire machine put in first class shape. Excellent condition. Located North Carolina. Box 696-SS.

⅝-YARD

MEAD MORRISON—⅝ CUBIC YARD GASOLINE SHOVEL. Good operating condition. Located near Boston. Box 706-SS.

P&H MODEL 300 SHOVEL—18' Boom, 15' Dipper Handle, ⅝ cubic yard Dipper, manganese front. Powered with Waukesha B U 4½"x6¼" engine, power clutch control. First class operating condition. Located Massachusetts. Box 663-SS.

¾-YARD

BUCYRUS-ERIE TYPE B STEAM COMBINATION SHOVEL-CLAMSHELL AND STEAM HOE. Machine completely rebuilt 1929. Good operating condition. Located near Boston. Box 517-SS

BUCYRUS-ERIE TYPE B HIGH LIFT STEAM SHOVEL. Caterpillar mounted. Good operating condition. Located New Haven, Connecticut. Box 776-SS.

BUCYRUS-ERIE TYPE B CATERPILLAR MOUNTED, HIGH LIFT STEAM SHOVEL. Good operating condition. Located Connecticut. Box 775-SS.

BUCYRUS-ERIE TYPE B STEAM SHOVEL, cat. mounted, equipped with 19'6" boom 16' dipper stick and ¾ yard dipper including 36' clamshell boom in good working order. Located near Hudson, Pennsylvania. Price $1000.00. Box 493-SS.

BUCYRUS-ERIE TYPE B STEAM SHOVEL, Cat mounted, 19'6" boom, 14' dipper handle, ¾ cubic yard dipper. also 36' clamshell boom and front drum and gearing. Located Kansas City, Missouri. Box 622-SS.

1—Type B Bucyrus-Erie Combination High Lift Shovel and 40' Clamshell Machine.
1—Type B Bucyrus-Erie High Lift Shovel.
2—Type B-2 Bucyrus-Erie High Lift Shovels.
All located western Connecticut. Operating condition. Entire lot very low price. Box 573-SS.

BUCYRUS-ERIE 20-B COMBINATION STEAM SHOVEL - CLAMSHELL - DRAGLINE. Good working condition. Caterpillar Mounted. Located near Peoria, Illinois. Box 701-SS.

BUCYRUS-ERIE TYPE B STANDARD ¾ YARD STEAM SHOVEL—Quarry type Dipper—Caterpillar mounted. Good operating condition. Located Georgia. Box 752-SS.

TYPE B BUCYRUS-ERIE HIGH LIFT STEAM SHOVEL. 21'3" Boom, 18'4" Dipper Handle, ¾ cubic yard inserted Tooth Dipper—Power Boom Hoist—Boiler Feed Pump—Caterpillar Mounted. Located Chicago. Box 699-SS.

KOEHRING MODEL 301 COMBINATION SHOVEL & 40' BOOM DRAGLINE, caterpillar mounted Gasoline Power. Good operating condition. Located Indiana. Box 764-SS.

MARION MODEL 21 ELECTRIC—M.G. SET ¾ YARD SHOVEL. Good condition. Located eastern Pennsylvania. Box 725-SS.

NORTHWEST MODEL 3 GASOLINE CABLE CROWD—FEATHER TOUCH CONTROL—SHOVEL. Good operating condition. Located northern Indiana. Box 798-SS.

OSGOOD MODEL 18 Steam—¾ yard shovel—Cat mounted. Just completely overhauled. Excellent condition. Located near Indianapolis, Ind. Box 522-SS.

TWO P&H TYPE 206, ¾ c.y. Gasoline Driven, Crawler Type, 38' Boom with 20' extension, good condition. Fair leads for one machine only. Price $3,000.00 cash each, F. O. B. job site.

One Insley, Type R, No. 128, Full Revolving, ½ c.y. excavator with dipper boom, dipper stick, and dipper; also 30' Boom with 9' extension for crane work. Gasoline Driven, Crawler Type, good condition. Price $2,800.00 cash, F. O. B. job site.

Immediate Delivery. Above equipment at Georgia State Prison site, Reidsville, Georgia. Address communications to **Struck Construction Company, Reidsville, Georgia.**

⅞-YARD

BUCYRUS-ERIE HIGH LIFT STEAM SHOVEL. B-2—⅞ CUBIC YARD DIPPER. Favorable price. Located vicinity Boston. Box 793-SS.

MARION MODEL 21—⅞ CUBIC YARD STEAM SHOVEL. Caterpillar Mounted. Good working condition. Located Georgia. Box 758-SS.

1-YARD

BAY CITY MODEL "S". 21' Boom, 16' Dipper Handle, 1¼ cubic yard Dipper Climax Blue Streak four cylinder 6"x7" Gasoline Engine. Electric Starter. Excellent condition. Located Boston. Box 757-SS.

BUCYRUS-ERIE LATE MODEL B-2 STEAM HIGH LIFT SHOVEL. 1 yard dipper—single shaft cat mounting. Good condition. Located near St. Louis. Box 518-SS.

BUCYRUS-ERIE GA-2 GAS-AIR COMBINATION ONE YARD SHOVEL AND 45' BOOM CLAMSHELL AND DRAGLINE not including Buckets Recently reconditioned. Located Indianapolis. Box 766-SS.

BUCYRUS-ERIE—GA-2 GAS-AIR SHOVEL. Extra High Lift. Caterpillar mounted. Good operating condition Waukesha 5¾"x8" four cylinder gasoline Engine. Air Starter. Located Chicago. Box 754-SS.

1 BUCYRUS-ERIE B-2 Steam ⅞ yard High Lift Shovel—Cat Mounted. Good operating condition. Located near Boston. Make offer. Box 521-SS.

If You Do Not Find What You Want Listed—Write Us

Excavating Engineer
South Milwaukee, Wisconsin

BUCYRUS-ERIE GA-2 Gas-Air High Lift Shovel. 24' Boom, 18'4" Dipper Handle, 1 cubic yard Dipper. Single shaft cat. Waukesha four cylinder gasoline engine. Excellent operating condition. Located Milwaukee. Box 645-SS.

BUCYRUS-ERIE B-2 Steam Combination Shovel and Clamshell Machine. Single shaft cat mounted. ¾ cubic yard Williams Clamshell Bucket included. Excellent mechanical condition. Located Virginia. Box 672-SS.

BUCYRUS-ERIE B-2 HIGH LIFT STEAM SHOVEL. 19'9" Boom, 16' Dipper Handle, ⅞ cubic yard inserted tooth Dipper. Two speed propelling gear. Located Boston. Box 716-SS.

BUYRUS-ERIE B-2 EXTRA HIGH LIFT STEAM SHOVEL. 21'3" Boom, 16' Dipper Handle, ⅞ cubic yard inserted tooth Dipper. Single Shaft Cat. Located Boston. Box 717-SS.

BUCYRUS-ERIE B-2 HIGH LIFT STEAM SHOVEL. Good operating condition. Located Minnesota. Box 794-SS.

FOR SALE

Address all box numbers c/o Excavating Engineer at South Milwaukee, Wisconsin

Small Shovels
Under 2 Yards
Continued

BUCYRUS-ERIE GA-2 COMBINATION SHOVEL AND DRAGLINE. 22'6" Shovel Boom, 16' Dipper Handle, 1 cubic yard cast front inserted tooth Dipper. 50' Dragline Boom including Fair leads but not Bucket. Air Starter. Good condition. Located Newark. Box 718-SS.

BUCYRUS-ERIE GA-2 HIGH LIFT SHOVEL. 24' Boom—18'4" Dipper Handle, 1 cubic yard Inserted Tooth Dipper. Also includes Forward Drum and Gearing and mechanism for clamshell operation including 45' boom. Also 1 cubic yard Williams clamshell bucket. Waukesha WL Engine. Good operating condition. Located Chicago. Box 702-SS.

BUCYRUS-ERIE MODEL B-2 High Lift Steam Shovel. Caterpillar mounted. Very good working condition. Located South Carolina. Box 644-SS.

BUCYRUS-ERIE MODEL B-2 High Lift Steam Shovel. Caterpillar mounted. Good working condition. Located northern New Jersey. Price very reasonable. Box 643-SS.

BUCYRUS-ERIE GA-2—Gas-Air Combination High Lift Shovel and 50' Boom Dragline Equipment, mounted on Single Shaft Cat Good operating condition. Located at Fort Smith, Ark. Box 537-SS.

B-2 EXTRA HIGH LIFT STEAM SHOVEL. 24' Boom—18'4" Dipper Handle—¾ yard Inserted Tooth Dipper—Boom Hoist—Caterpillar Mounted—Good operating condition. Located Chicago. Box 700-SS.

LORAIN—MODEL 60—One cubic yard Gasoline Shovel. Good condition. Located Chicago. Box 677-SS.

If You Do Not Find What You Want Listed—Write Us

Excavating Engineer
South Milwaukee, Wis.

MARION 1 CUBIC YARD STEAM SHOVEL. Bargain Price. Box 777-SS.

MARION 1 YARD STEAM SHOVEL. Box 575-SS.

NORTHWEST MODEL 105 GASOLINE CATERPILLAR MOUNTED COMBINATION SHOVEL AND DRAGLINE INCLUDING BUCKET. Good operating Condition. Located near Chicago. Box 795-SS.

P & H MODEL 600—1 yd. Gasoline Shovel—including 40' boom dragline equipment without bucket. Waukesha Engine. Recently overhauled. Located in Alabama. Box 483-SS.

P&H MODEL 600—1¼ CUBIC YARD GASOLINE SHOVEL. Will be put in good operating condition. Located eastern Pennsylvania. Box 664-SS.

P&H—MODEL 600—Combination 1 yard shovel and 40' boom dragline including dragline bucket. Waukesha gasoline engine. Machine in fair operating condition. Located Georgia. Box 695-SS.

BARGAIN PRICES

ONE P&H MODEL 208, 1 yd., electric shovel. ONE P&H MODEL 208, 1 yd., clamshell. 2 STIFF LEG DERRICKS. Located near Milwaukee. Box 801-SS.

1¼-YARD

BUCYRUS-ERIE GA-2 Gas-Air Extra High Lift Shovel—24' Boom, 18'4" Dipper Handle, 1¼ cu. yd. Dipper, Single Shaft Cat. Electric Starter. Excellent condition. Located eastern Pennsylvania. 592-SS.

BUCYRUS-ERIE GA-3—1¼ CU. YD. HIGH LIFT SHOVEL, Waukesha 6¾"x8" 6 cyl. gasoline engine. Excellent condition. Favorable price. Located in Montana. Box 780-SS.

BUCYRUS-ERIE GA-2 HIGH LIFT SHOVEL—24' boom, 16' dipper handle, 1¼ cubic yard dipper, on single shaft cat. Electric starter, Waukesha 4-cylinder 6¼"x8" gasoline engine. Reported excellent condition. Located Virginia. Box 623-SS.

BUCYRUS-ERIE 41-B STEAM SHOVEL—21' Boom, 15' Dipper Handle, 1¼ cu. yd. Dipper, Power Boom Hoist, Cat mounted. Located New York City. Box 546-SS.

BUCYRUS-ERIE — DIESEL-AIR — COMBINATION SHOVEL AND DRAGLINE. 22'6" Boom—16' Dipper Handle—1¼ cubic yard Inserted Tooth Dipper. 45' Boom Complete Dragline Equipment without bucket. Engine—Atlas Diesel. Located Oklahoma. Good operating condition. Box 703-SS.

BUCYRUS-ERIE GAS-AIR TYPE GA-2 HIGH LIFT SHOVEL — 22'6" boom — 16' dipper handle—1¼ yard cast front inserted tooth dipper—single shaft caterpillar mounting—electric starter. Excellent condition. Field reconditioned. Waukesha 4-cylinder 6¼"x8" engine — New cylinder blocks and piston rings. Located near Scranton, Pennsylvania. Will demonstrate. Box 508-SS.

BUCYRUS-ERIE GAS+AIR—22' Boom, 16' Dipper Handle, 1¼ cubic yard Dipper, Waukesha 6¼"x8" four cylinder gasoline engine. Single Shaft Cat mounted. First class condition. Located eastern New York. Box 601-SS.

BUCYRUS-ERIE 41-B STEAM SHOVEL. 21' Boom, 15' Dipper Handle, 1¼ cubic yard Dipper. First class operating condition. Located New York. Box 719-SS.

LIMA MODEL 101—Combination 1¼ yard shovel and 40' plus 10' extension Dragline—powered with gasoline engine Model JK 6½" x7"—4 cylinder. Shovel equipment practically new. Located Colorado. Box 599-SS.

LINK-BELT MODEL K-42 1¼ YARD GASOLINE SHOVEL. Waukesha Model WL 6¼"x 8" 4-cylinder Engine—new blocks and pistons this year. Good working condition. Located Colorado. Box 738-SS.

LORAIN—75-A—One and one-quarter cubic yard Gasoline Shovel. Good condition. Located Chicago. Box 676-SS.

LORAIN MODEL 75-B GASOLINE COMBINATION SHOVEL AND DRAGLINE. 1¼ cubic yard Shovel Dipper and 1¼ cubic yard Dragline Bucket included. New in 1929. Good working condition. Located near Denver, Colorado.

Ray Corson Machinery Company
1646 Wazee Street
Denver, Colorado

THEW LORAIN MODEL 75 SHOVEL. 24' Boom, 18' dipper handle, 1¼ cubic yard dipper. Gasoline. Machine now operating. Located central New York State. Box 665-SS.

MARION TYPE 32 STEAMER. Shop No. 5676, 18' boom, 15' dipper handle, 1¼-cu. yd. dipper shipped May, 1926, good operating condition. Box 451-SS.

NORTHWEST MODEL 105 SHOVEL. Bargain Price. Located Texas. Box No. 566-SS.

P&H MODEL 650 1-¼ CUBIC YARD SHOVEL. POWER DIPPER TRIP. Electric Starter. Split Second Control of Power Clutches. Waukesha 4-cylinder 6-¼"x8" Engine. Excellent condition. Located Milwaukee. Box 796-SS.

1½-YARD

BUCYRUS-ERIE 35-B ELECTRIC 24' BOOM, 16' Dipper Handle, 1½ cu. yd. Dipper, 3 phase, 25 cycle, 440 volt, Cat mounted. Box 544-SS.

BUCYRUS-ERIE—42-B—STEAM SHOVEL—21' Boom, 15' Dipper Handle, 1½ cubic yard Vanderhoef Dipper, Power Boom Hoist, Dipper Trip. Located Connecticut. Box 786-SS.

BUCYRUS-ERIE 43-B GASOLINE CHAIN CROWD SHOVEL — 23' boom — 17' dipper handle—1½ cubic yard Vanderhoef dipper and teeth—electric starter—standard single shaft cat. Operated less than six months. Excellent appearance and condition. Will be demonstrated by owner. Located vicinity New York. No. 512-SS.

If You Do Not Find What You Want Listed—Write Us

Excavating Engineer
South Milwaukee, Wisconsin

LORAIN 75 COMBINATION SHOVEL AND DRAGLINE. 1¼ cubic yard Shovel Equipment. 50' Dragline Boom, without bucket. Waukesha 6¾"x8" four cylinder gasoline engine. Excellent condition. Located eastern Pennsylvania. Box 720-SS.

TWO LORAIN 75-B COMBINATION 1¼ CUBIC YARD SHOVEL AND 50' BOOM DRAGLINES — without buckets. Gasoline power. Good working condition. Located eastern Pennsylvania. Box 721-SS.

LORAIN 75-B 1½ CUBIC YARD SHOVEL. Gasoline power. Good working condition. Located eastern Pennsylvania. Box 722-SS.

OSGOOD "VICTOR" 1½ CUBIC YARD SHOVEL AND 50' BOOM CLAMSHELL MACHINE. Gasoline Power. Good operating condition. Located Wisconsin. Box 760-SS.

P&H MODEL 700—1-½ CUBIC YARD GASOLINE SHOVEL. Waukesha 7-½"x8" 150 Horsepower Engine. Excellent operating condition. Located New Mexico. Box 797-SS.

P & H MODEL 700—1½ CU. YD. GASOLINE SHOVEL. Engine: Waukesha 4-cyl. 7½"x8". Fair working condition. Located New Mexico. Bargain price. Box 789-SS.

1¾-YARD

BUCYRUS-ERIE—50-B—DIESEL SHOVEL. 38' Boom, Two 19' Dipper Handles. 1¾ Cubic Yard Rock Bucket and 1¾ Cubic Yard Dirt Bucket. 60' Boom Dragline Equipment without bucket included. Shovel only located Montana. Dragline equipment located Minnesota. Box 785-SS.

WANTED

Will pay cash for one steam or gas dragline, about 60' boom, 2 yard bucket. Caterpillar mounted. Give particulars. Location Indiana. Box 800-SS.

FOR SALE

Address all box numbers c/o Excavating Engineer at South Milwaukee, Wisconsin

Small Draglines
Under 2 Yards

⅜-YARD

TWO ⅜-YARD SARGENT SCOUT DRAGLINES. Powered with McCormick-Deering Model 200 4-cylinder 4¼x5 heavy duty gas engines. Cable speed 160 fpm, single line. Two traveling speeds. Capacity as crane from 8000 lbs. at 8 ft. radius to 2800 lbs. at 24 ft. radius. First class mechanical condition. Located Iowa and Minnesota. Box 772-SD.

UNIVERSAL-UNIT ¾ swing combination 30-foot boom gasoline dragline and ⅜ cu. yd. shovel. ⅜ cu. yd. dragline bucket. Working every day. Good condition. Located Grand Haven, Michigan. Box 769-SD.

¾-YARD

BUCYRUS-ERIE 20-B COMBINATION STEAM DRAGLINE - CLAMSHELL - SHOVEL. Good working condition. Caterpillar Mounted. Located near Peoria, Illinois. Box 701-SD.

KOEHRING MODEL 301 COMBINATION 40' BOOM DRAGLINE & SHOVEL. caterpillar mounted. Gasoline Power. Good operating condition. Located Indiana. Box 764-SD.

1-YARD

BUCYRUS-ERIE GA-2 COMBINATION DRAGLINE AND SHOVEL. 50' Dragline Boom including Fairlead but not Bucket. 22'6" Shovel Boom, 16' Dipper Handle, 1 cubic yard cast front inserted tooth Dipper. Air Starter. Good condition. Located Newark. Box 718-SD.

BUCYRUS-ERIE GA-2 GAS-AIR COMBINATION 45' BOOM DRAGLINE AND CLAMSHELL AND ONE YARD SHOVEL. Buckets not included. Recently reconditioned. Located Indianapolis. Box 766-SD.

LINK-BELT 1 CUBIC YARD CAPACITY 50' BOOM DRAGLINE WITHOUT BUCKET. Gasoline power. Reported good operating condition. Located near Chicago. Box 724-SD.

P&H—MODEL 600—Combination 40' boom dragline and 1 yard shovel including dragline bucket. Waukesha gasoline engine. Machine in fair operating condition. Located Geor- Box 695-SD.

1¼-YARD

BUCYRUS-ERIE — DIESEL-AIR — COMBINATION DRAGLINE AND SHOVEL. 22'6" Boom—16' Dipper Handle—1¼ cubic yard Inserted Tooth Dipper. 45' Boom—Complete Dragline Equipment without bucket. Engine—Atlas Diesel. Located Oklahoma. Good operating condition. Box 703-SD.

1½-YARD

LINK-BELT MODEL K-44 45' BOOM PLUS TWO 10' AND ONE 5' EXTENSIONS—TOTAL 70' DRAGLINE WITHOUT BUCKET. Gasoline power. Includes 800 Watt Kohler Light Plant. Located near Chicago. Good operating condition. Box 723-SD.

2 LORAIN 75-B COMBINATION DRAGLINES AND SHOVELS. 50' dragline booms without buckets. 1½ cubic yard shovel equipment. Gasoline power. Good working condition. Located eastern Pennsylvania. Box 721-SD.

LORAIN 75 COMBINATION DRAGLINE AND SHOVEL. 50' Dragline Boom without Bucket. 1¼ cubic yard Shovel Equipment. Waukesha 6¾x8" four cylinder gasoline engine. Excellent condition. Located eastern Pennsylvania. Box 720-SD.

TWO P&H 700 DRAGLINES. 1½ cu. yd. buckets on 50' booms. Gas and Diesel. Located Lower Rio Grande Valley, Texas. Box 618-SD.

1¾-YARD

BUCYRUS-ERIE — 43-B GASOLINE — COMBINATION DRAGLINE AND CLAMSHELL— 1¾ cubic yard Bucket capacity—no bucket. Good condition. Located Arizona. Box 704-SD.

If You Do Not Find What You Want Listed—Write Us

Excavating Engineer
South Milwaukee, Wis.

Small Clamshells and Cranes
Under 2 Yards

⅜-YARD

BAY CITY "PUP" CLAMSHELL MACHINE. Good operating condition. Box 514-SCC.

½-YARD

BYERS BEARCAT CLAMSHELL—Crane—30' boom. Will handle ½ cubic yard bucket. Located near Grand Rapids, Mich. Box 648-SCC.

GENERAL—GASOLINE—35' BOOM CLAMSHELL. Now operating near St. Joseph, Illinois. Box 782-SCC.

ORTON 24' BOOM—½ CUBIC YARD CLAMSHELL MACHINE. ½ cubic yard Owen Clamshell Bucket. Hercules 55 HP. Gasoline Engine. Factory rebuilt 1932. Good operating condition. Located Tennessee. Box 709-SCC.

UNIVERSAL—MODEL NO. 35—28' boom clamshell and ½ cu. yd. shovel including ½ cu. yd. Owens clamshell bucket. Powered by Waukesha four cylinder 4½" x 6¼" gasoline engine. Engine completely overhauled this year. Entire machine put in first class shape. Excellent condition. Located North Carolina. Box 696-SCC.

¾-YARD

BUCYRUS-ERIE 20-B COMBINATION STEAM CLAMSHELL - DRAGLINE - SHOVEL. Good working condition. Caterpillar Mounted. Located near Peoria, Illinois. Box 701-SCC.

O & S MODEL "T" ¾ yard clamshell machine. 40' boom. Good working condition. Powered with Climax 5½"x7" gasoline engine. Located near St. Louis. Good working condition. Box 651-SCC.

1-YARD

BUCYRUS-ERIE GA-2 45' BOOM CLAMSHELL MACHINE. Single Shaft Cat. Waukesha 5¾"x8" four cylinder gasoline engine. Good operating condition. Located St. Paul, Minnesota. Box 761-SCC.

BUCYRUS-ERIE GA-2 GAS-AIR COMBINATION 45' BOOM CLAMSHELL AND DRAGLINE AND ONE YARD SHOVEL. Buckets not included. Recently reconditioned. Located Indianapolis. Box 766-SCC.

1¼-YARD

P&H MODEL 700—50' BOOM CLAMSHELL MACHINE INCLUDING 1¼ CUBIC YARD OWEN CLAMSHELL BUCKET. Waukesha 6¼"x8" four cylinder gasoline Engine. Excellent condition. Located Chicago. Box 762-SCC.

NORTHWEST MODEL 105 Gasoline—40' boom clamshell. Good operating condition. Located Iowa. Box 516-SCC.

1½-YARD

OSGOOD "VICTOR" 50' BOOM CLAMSHELL MACHINE AND 1⅛ CUBIC YARD SHOVEL. Gasoline Power. Good operating condition. Located Wisconsin. Box 760-SCC.

1¾-YARD

BUCYRUS-ERIE — 43B GASOLINE — COMBINATION CLAMSHELL AND DRAGLINE— 1¾ cubic yard Bucket capacity—no bucket. Good condition. Located Arizona. Box 704-SCC.

Large Shovels and Draglines
2 Yards and Over

1½-W MONIGHAN WALKER. Diesel power. 2 yard capacity. 60-foot boom Good condition Reasonably priced. Located Kansas. Box 742-LSD.

2-W MONIGHAN WALKER 3½ yard capacity. 70-foot boom. Good condition. Reasonably priced. Located Kansas. Box 743-LSD.

50-B STEAM SHOVEL, Number 3946; equipped with 1½-cubic-yard dipper, 26-foot boom, also 1½-cubic-yard dragline bucket with 50-foot boom caterpillar mounted, equipped for burning oil, located at Texarkana, Ark. Price $3,000. Box 112-LSD.

PAGE DRAGLINE, track mounted, 90-foot boom, 3½-yard Page RC bucket with new 150 h.p. Venn-Severin Diesel engine. Thoroughly overhauled and rebuilt in 1935. Now working in Indiana. Box 768-LSD.

CLASS 320 STEAM DRAGLINE. 144-foot boom. 8-yard bucket. Located on Illinois River. A good buy. Box 750-LSD.

CLASS 230 STEAM DRAGLINE. 175-foot steel and aluminum boom. 6-yard RED ARCH bucket. Ready to work. Located near New Roads, Louisiana. Box 751-LSD.

TYPE 175-B ELECTRIC, No. 794 equipped with 87' shovel boom, 48' dipper handle, 3½-yd. bucket, and dragline equipment including 125' boom, and 3½-yd. bucket. This machine was recently reconditioned and is in good operating condition. Present, location, Connecticut. Box 263-LSD.

100-B STEAM SHOVEL, 3 yd. dipper, location Eastern Canada. Immediately available. Used—good condition. Box 669-LSD.

FOR SALE

Address all box numbers c/o Excavating Engineer at South Milwaukee, Wisconsin

3-W MONIGHAN DIESEL DRAGLINE. 85-foot boom. Electric Swing. 2 buckets—2½ and 3½ cu. yd. capacities. Located Evansville, Indiana. Might be loaded on barge. Box 787-LSD.

MONIGHAN DRAGLINE MODEL T, 2-cubic-yard 60-foot boom located near Wichita, Kansas. About seven years old. Has recently been thoroughly overhauled. Box 180-LSD.

MONIGHAN STEAM DRAGLINE, two cubic yards capacity. 60' boom. Horizontal locomotive-type boiler. 2½-yard Page bucket. In good operating condition; overhauled in 1931 and not used. Located Iowa. Box 770-LSD.

CLASS 14 STEAM DRAGLINE, 60' boom. 2 cubic yard Page bucket. Locomotive-type boiler. Thoroughly overhauled and ready for service. Located Iowa. Box 771-LSD.

TWO 3-W MONIGHAN WALKERS. 3½ yards. 70- and 77-foot booms. Good condition. Reasonably priced. Located Louisiana. Box 745-LSD.

BUCYRUS 320-B STEAM STRIPPING SHOVEL, shop number 4205, new in 1925, used less than four years. Located at Toronto, Ohio. Box 74-LSD.

2-W MONIGHAN WALKER. 2½ yard capacity. 70-foot boom. Good condition. Priced reasonably. Located Louisiana. Box 744-LSD.

FOR SALE OR RENT
TWO CLASS 14 STEAM DRAGLINES, caterpillar mounted, equipped for burning gas or oil. Located, Southwest. Price approximately $4,000 each. Box 619-LSD.

50-B STEAM DRAGLINE. 1½-yard bucket. 60-foot boom. Located in Alabama. Box 747-LSD.

CLASS 14 DIESEL-ELECTRIC DRAGLINE. 70-foot boom. 2-yard bucket. Immediately available. Located near St. Louis. Box 749-LSD.

70-C BUCYRUS STEAM SHOVEL on Cats. Complete. In operating condition. Shop number 1712. Also one extra three-yard Manganese dipper and sticks. Chicago territory. Box 347-LSD.

If You Do Not Find What You Want Listed—Write Us

Excavating Engineer
South Milwaukee, Wisconsin

68-C BUCYRUS ELECTRICALLY OPERATED SHOVEL, equipped with 2½-yard manganese front dipper, 3 phase, 60-cycle, 440-volt motors, transformers, cable, reel and approximately 1400 feet of cable all in excellent condition. Reasonable price. Address Box 268-LSD.

MARION MODEL 350 W. L. SHOVEL. New 1923. 90' boom, 55' handle, 6 yd. dipper, 3 phase, 60 cycle, 2300 volts, series motors. Has handled about 1,000,000 yds. stripping. Good condition. Location Iron Range. Box 656-LSD.

Locomotives

LOCOMOTIVES

3 BALDWIN, 17x24, straight drive standard gauge 45 ton locomotives. 54 inch boilers. Shop numbers from 32,750 to 34,611. Each one has passed State Boiler Inspection yearly. Boilers will stand cold water test of 240 lbs. At present in actual service in Minnesota mine. Box 152-ME.

Locomotive Cranes

TWO AMERICAN STEAM LOCOMOTIVE CRANES. Each 8 wheel—25 ton capacity. Each equipped with 8¼"x10" double cylinder engine. Boom 50'. Steam brakes and train air line. Boiler 54"x101" ASME—130 pounds pressure. Standard gauge 4'x8½". Used only eight months. Splendid condition. Box 628-ME.

Miscellaneous Equipment

WELDING AND CUTTING OUTFITS

Complete Welding Outfits, $44.82.

Combination Welding and Cutting Outfit, $59.81.

Heavy Duty Cutting Outfit, $49.62.

The Superior Oxy-Acetylene Company
Hamilton, Ohio

The Bargain of the Year

ONE COMPLETE NARROW GAUGE DIRT MOVING OUTFIT including camps, shop and haulage equipment. Located near Fort Wayne, Indiana. Can you use it?

50 Shovels and picks, approximate.
1 Fairbanks Morse gasoline engine and 5x5 bulldozer pump 3 HP.
2 Fairbanks Morse gasoline engine and 3x5 bulldozer pump 1½ HP.
4 Track jacks, 15 ton.
3 Track jacks, light.
1 Duplex Pump—Worthington, 5¼x3½x5.
10 Slips.
1 Anvil.
1 Forge.
6 Switches.
4 Frogs.
10 Switch points.
1 Carbide light.
20 Western dump cars, 5-yard.
2 Galvanized water tanks, wagon size.

Will consider individual sale of separate items.

Address Box 449 ME.

4—75 DIESEL CATERPILLAR TRACTORS.
4—EUCLID DUMP WAGONS. Located eastern Pennsylvania. Box 710-ME.

COMPLETE CONTRACTORS EQUIPMENT

Offered for sale by Southern contractor. Priced to sell.

7—Railroad Type Steam Shovels 2½ to 5 yd.
3—Full Revolving Shovels, ¾ yd.
1—Gasoline Clamshell Crane ½ yd.
2—Jordan Spreaders.
2—Locomotives, 26 Ton, American Saddle Tank.
32—12-yd. Western Heavy Duty Dump Cars.
1—Flat Car.
3—Camp Cars.
2—1-bag Gasoline Concrete Mixers.
Pumps, Boilers, Jacks and Other Tools.

For further particulars, Address Box 138-ME.

WANTED
8 inch spiral pipe with flanges, some sleeve pipe.
Also
8 inch hydraulic dredge.
Box 799-ME.

WANTED
CONTRACTOR FOR STRIPPING. Owner of coal mine near Danville, Illinois, wishes to contract with owner of a dragline with 70 foot boom for from 1-5 years stripping of overburden from 18-30 feet deep, at 8c per cubic yard. Or have you a dragline to rent by day or month. Write Box 802-ME.

WANTED
1000 feet or more used 30-inch conveyor belt and necessary idler equipment. Must be in good condition and reasonably priced. Box 790-ME.

BRAND NEW PAGE DRAG SHOVEL EQUIPMENT suitable for application to Bucyrus-Erie 1030, 1035, or 32-B machines now in the field, consisting of 17'1½" boom, 11' dipper handle, and two ¾ cubic yard dippers; one 38" wide over cutters—the other 49½" wide over cutters, together with auxiliary A frame and ropes. Priced below cost. Box 683-ME.

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Headquarters and Works: LINCOLN, ENGLAND
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ABYSSINIA: W. H. Miles, Esq., 41, Osmond Road, Hove, Sussex, England.
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